TECHNOLOGY DEPT.

- How Charmin Paper makes torula yeast
- Polyamide and polyamide-epoxy resins
- New soil builder from bark
- Control systems in pulp washing

The Paper Industry

IN TWO SECTIONS—SECTION ONE

Publishers of PAPER AND PULP MILL CATALOGUE

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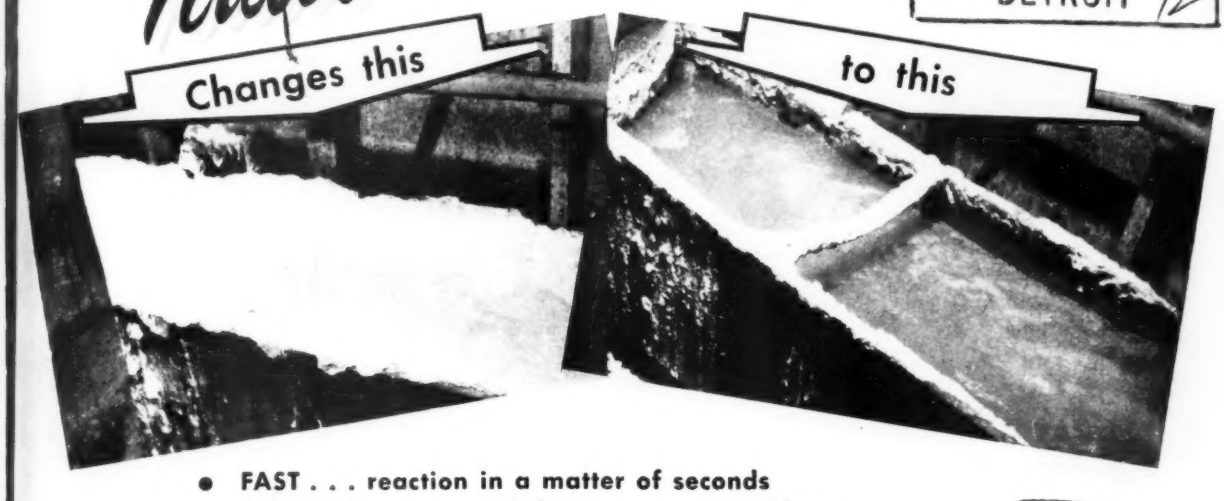
DETROIT

Nalco 71-B LIQUID ANTIFOAM



- **FAST . . . reaction in a matter of seconds**
- **EFFECTIVE . . . as a defoamer—as an antifoam**
- **FAR MORE ECONOMICAL . . . than paste or briquette**

Here is what happened when *liquid* Nalco 71-B was tried in a well-known mill plagued with the foaming problem of high-resin pulp.

At a cost of only *one-sixth as much* as the previous antifoam, the mill reported Nalco 71-B *eliminates all foam in seconds!* Sheet quality remains high, and production stoppages and slow-downs due to foaming have been eliminated. Fibre loss to sewers is extremely low and cleaning of cell room and screens has been substantially reduced. Small wonder the mill continues to use Nalco *liquid* 71-B in both primary and secondary pulp screen processes.

There is a whole series of Nalco antifoams designed to get *results* like this in your mill. Ask your Nalco Representative about them, or write direct to Nalco.

NATIONAL ALUMINATE CORPORATION, 6232 West 66th Place, Chicago 38, Illinois • Telephone: POrtsmouth 7-7240

CANADA: Alchem Limited, Burlington, Ontario

Branches in SPAIN, ITALY and WEST GERMANY

THE Nalco® SYSTEM...Serving the Paper Industry through Practical Applied Science

Chinese Rouge Box of the Ch'ien-lung Dynasty (1736-1795 A.D.). Made of blue and white porcelain, featuring the Yang-Yin symbol on the cover.

Courtesy of The Metropolitan Museum of Art, New York.

This symbol (Yang-Yin) represents T'ai-chi, the old Chinese *Ultimate Principle*, and as such, perfection. As the Asten-Hill trademark it symbolizes perfection in ASTEN DRYER FELTS for paper mills.

Name and trademark registered

ASTEN-HILL MFG. CO.
Philadelphia 29, Pa.
Walterboro, S.C.
Salem, Ore.

ASTEN-HILL LIMITED
Valleyfield, Quebec

YPE

TYP

TY

YPE 657A

port globe body for conven- service. Also supplied single here tight closure required. ly supplied in iron or steel in " thru 12".

TYPE 657YY

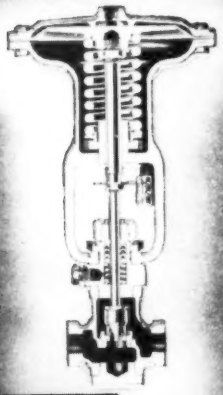
Three-way control valve for by-pass or blending service. Eliminates need for two globe type control valves. Available all castable alloys sizes ½" thru 12".

FISHER®

Has the control valve for your mill

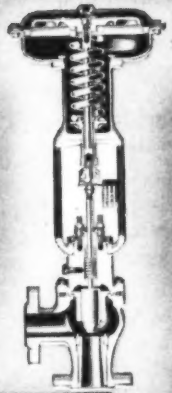
TYPE 667Z

type body in which parts are ly accessible; can be econom- supplied in various alloys rrosive service. Available in ed sizes ⅓" thru 2".



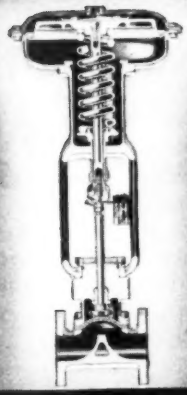
TYPE 510G

Small and compact bronze control valve for relatively light service. Available in screwed sizes ½" thru 2".



TYPE 657-458

control valve for handling containing solids, or flashing which are erosive. Normally ied in steel flanged ends in 1" thru 6".



TYPE 657-SAUNDERS

Fisher operator on Saunders patented valve is widely used on "hard to handle" fluids which are viscous and/or corrosive. Available in wide variety of materials in sizes ½" thru 6".

Special design bodies for process services

Wide selection of sizes and available in all castable alloys

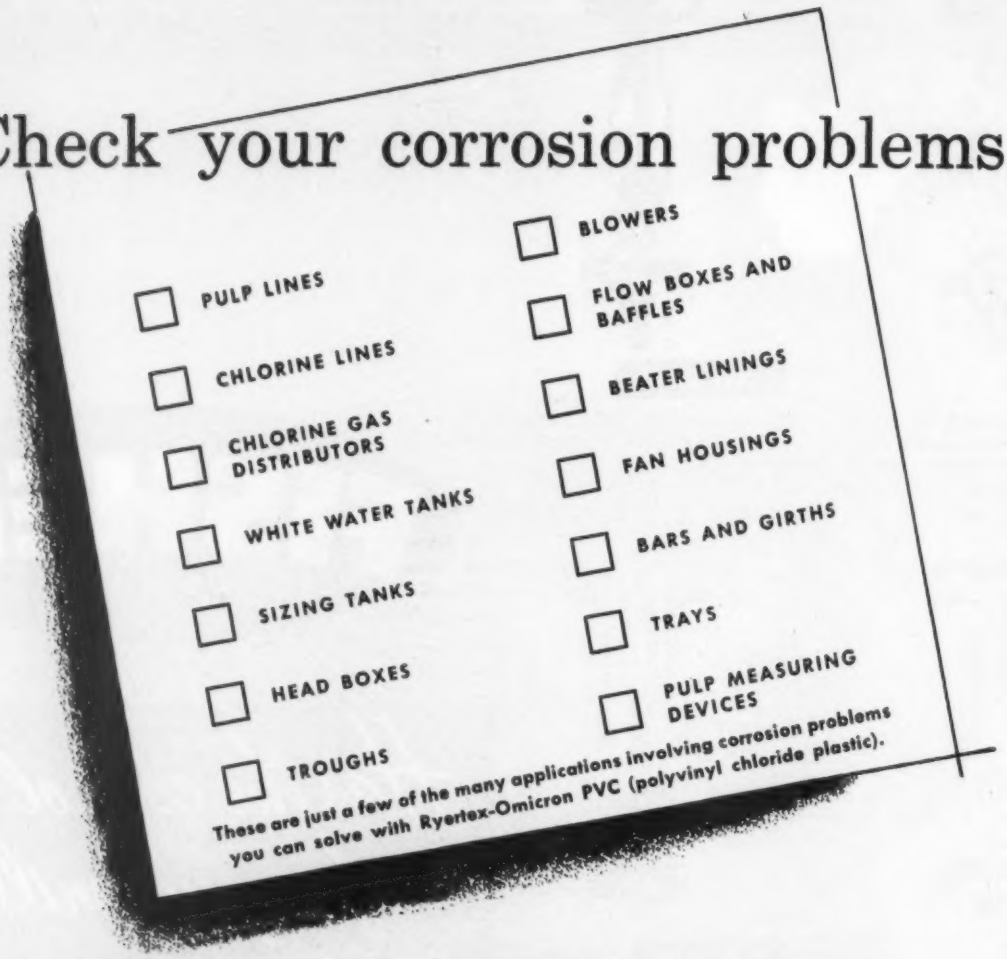
Supplied with improved diaphragm operator that provides accurate valve response

FISHER GOVERNOR COMPANY · MARSHALLTOWN, IOWA

CANADIAN PLANT: WOODSTOCK, ONTARIO

LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE AND LIQUID LEVEL CONTROL

Check your corrosion problems



STOP CORROSION CUT COSTS

with RYERTEX-OMICRON PVC

This *original* PVC has set remarkable service records for the past 20 years—and is now available in the United States for the first time—only from Ryerson.

Data on Properties—Ryertex-Omicron PVC resists the attack of chlorine bleaches, kraft liquor, sulfite liquor and hundreds of other chemical solutions and gases over years of exposure. It withstands working temperatures of 185° F. in continuous service; weighs only 1/6 as much as steel—½ as much as aluminum—and can be welded, formed and machined as readily as metal. Its smoothness and density give it low flow resistance and it will not support combustion.

Available Shapes—You can get quick shipment of Ryertex-Omicron PVC from Ryerson stocks in sheets, rods, pipe, valves and fittings in a wide range of sizes. Sheets up to ½" thick are fully extruded (not laminated).

Answers to your Questions in New Bulletin—Our bulletin 80-3 tells all about this amazingly versatile material and its applications. Write for your copy today and call your nearby Ryerson plant for any PVC requirement.

RYERSON STEEL INDUSTRIAL PLASTICS AND BEARINGS DIVISION

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK · BOSTON · WALLINGFORD, CONN. · PHILADELPHIA · CHARLOTTE, N. C. · CINCINNATI CLEVELAND · DETROIT · PITTSBURGH · BUFFALO · CHICAGO · MILWAUKEE · ST. LOUIS · LOS ANGELES · SAN FRANCISCO · SPOKANE · SEATTLE

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Technology • Engineering • Management • Production

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** Index to Volume 38 appears as a part of this issue.

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Introducing

AMERICAN INDUSTRIAL CLAYS, Inc.

...a new source of clays... for the Paper Industry

Over 30 years experience
Enormous separate reserves
Latest processing facilities
Location: Sandersville, Georgia

In one of the world's richest deposits of high grade kaolin clays, new research, mining and processing facilities of the latest types will be in operation in the Spring of 1957. This large enterprise is designed primarily to provide an additional source of supply of quality clays for the Paper Industry.

The tremendous growth of the Paper Industry within recent years and the consequent unprecedented increase in demand for coating and filler clays, make the establishment of the new company a sound venture. It is of particular importance to those pulp and paper manufacturers whose materials procurement policies call for two or more separate sources of supply.

American Industrial Clays, Inc., welcomes your inquiries for a complete range of spray dried and acid flocced kaolin clays for the Pulp and Paper Industry.

AMERICAN INDUSTRIAL CLAYS, Inc.

18 West Jersey Street, Elizabeth, N. J.
Mines and Plant at Sandersville, Georgia

From our point of view . .

We shall need all our resources

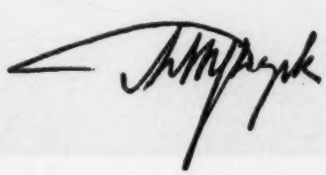
As announced by G. A. Price, chairman and president of Westinghouse Electric Corp., at the American Power Conference in Chicago on March 28, the enormous sum of 6.3 billion dollars will be spent on industrial research in the United States this year. The extent of systematic application of scientific knowledge to industrial problems that is involved by this expenditure is without parallel in history anywhere in the world.

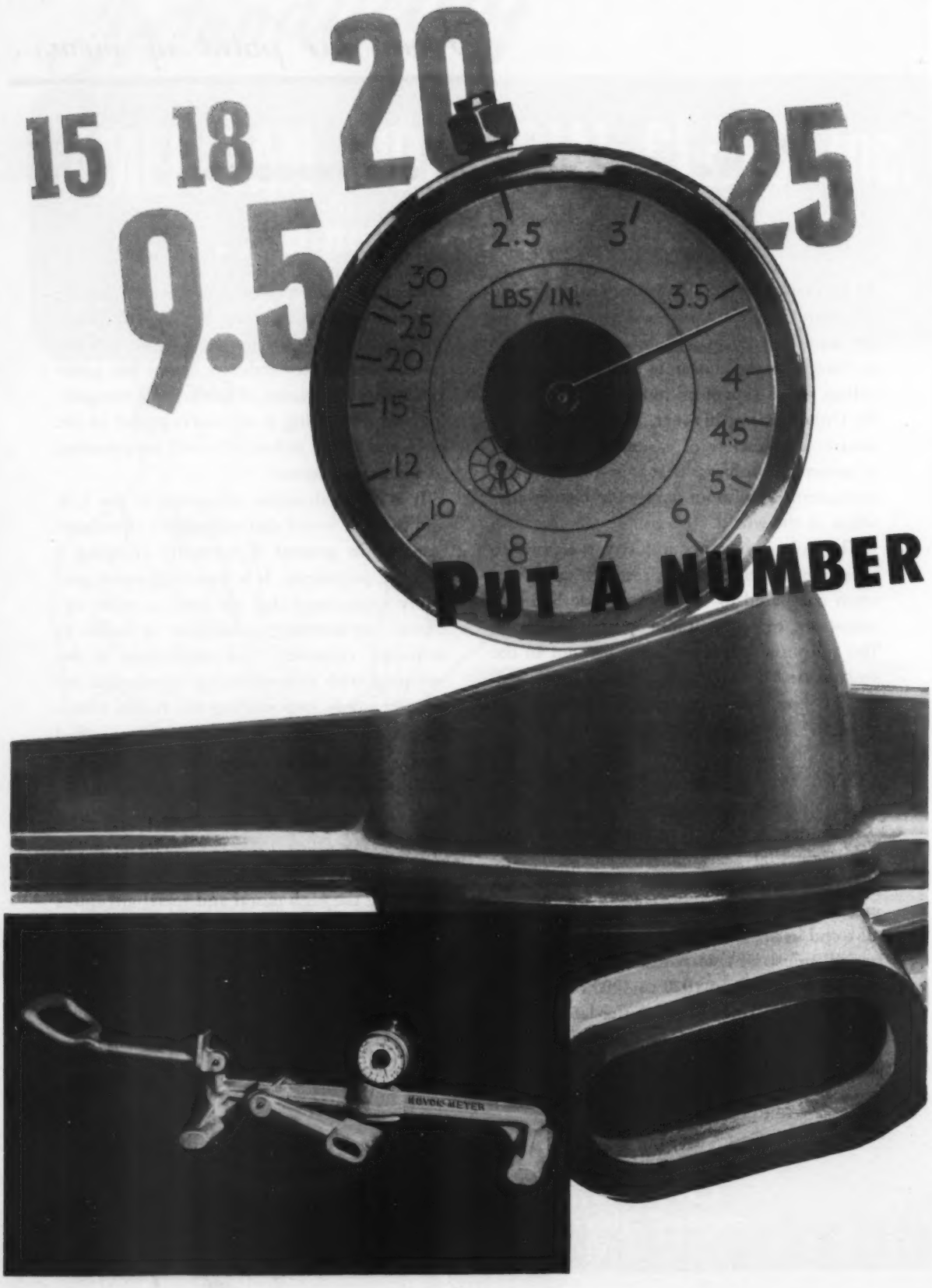
The pulp and paper industry is known to have lagged behind in its research endeavor, when compared to the efforts made by other industries of comparable output capacity. The pulp and paper industry has not in the past utilized its engineering and scientific talents to best advantage. Scientifically-trained men and chemical engineers were, and in some cases still are, being used largely as routine bench chemists rather than for their special qualifications in creative work.

Attitudes, however, are changing fast, and new industrial research laboratories in the pulp and paper field are being erected with increasing frequency — in line with the overall trend in the United States, where the number of industrial research laboratories has increased from 220 in 1920 to 4000 in 1956. In the pulp and paper industry the latest industrial research laboratory is that of Bowaters Research & Development Inc., which will coordinate development and production for the Bowater organization in the United States and Canada. K. O. Elderkin — who as a nationally-recognized industry leader has greatly advanced the cause of research by recognizing and promoting it as a nerve center of the pulp and paper industry — will be president of the new company.

It is of incalculable advantage to the U.S. and the free world that the subject of creative research in general is currently enjoying a burst of popularity. It is becoming more generally appreciated that we have to create optimum environment conditions in order to stimulate creativity. The realization is developing with ever-widening impact that we must not only stop stuffing our brains with a mush of trivialities but subject them instead to the comparable discipline, exercise, and nourishment that have given this nation its high standard of physical health and well being.

We shall need all our talents and resources, including the high moral and social attributes we require to behave as human beings, as we enter a more complicated age of electronics, nucleonics, automation, and jet propulsion. It is an age where we can hold our own only with a minimum of errors, as a minimum requirement.

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LBS/IN.
PUT A NUMBER
NOVOMETER

HUYCK-METER relates felt tension to Performance

CASE HISTORIES	TYPE OF MACHINE	SPEED	PRODUCT	HUYCK-METER READING AT JACK	FELT PERFORMANCE
Mill "A"	Multi-Cylinder	300 f.p.m.	Folding Grade	12 to 15 lbs. per inch	No stretching, dropoffs, cylinder blows, crushing or checking.
Mill "B"	Multi-Cylinder	300 f.p.m.	Folding Grade	30 lbs. per inch and Over	Life very short—10 days and under. Stretching, edge cracks and warp breaks.

30 ON FELT TENSION

HUYCK-METER readings, as shown in the accompanying table, provide the only practical means for:

1. **relating felt tension to performance;**
2. **measuring the tension of felts running on machines to permit proper openness and maximum life.**

In addition... the HUYCK-METER affords an ideal method for setting felt draws on machines where clothing serves as a power transmission belt. And, when used with the equally famous Kenwood Measuring Wheel, it makes possible a *complete* "power balance" in the felt section.

Used only by your Huyck Field Service Engineer, the HUYCK-METER enables the accumulation of data that helps you increase production... improve paper quality ...and lower cost. Plan for a "mill survey" now.

KENWOOD MFG. CO. TEXTILE PRODUCTS

F. C. Huyck & Sons,
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Altavville,
Peterboro[illegible] N. H.
Cavendish,
In Canada: Kenwood [illegible],
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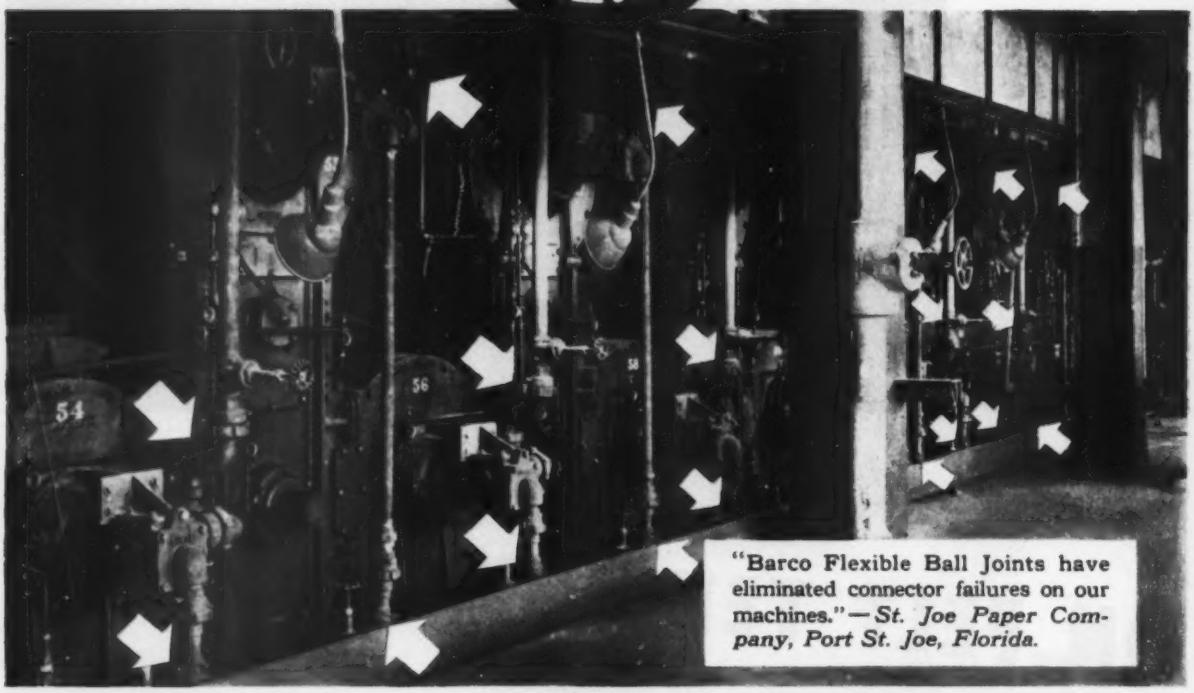
HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

FLEXIBLE BARCO BALL JOINTS



"Barco Flexible Ball Joints have eliminated connector failures on our machines."—*St. Joe Paper Company, Port St. Joe, Florida.*

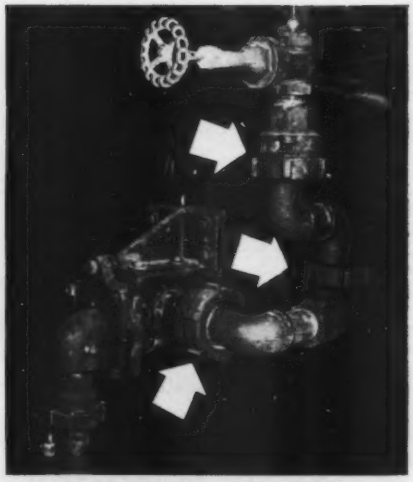
The Solution for "Connector Failures" On New, High Pressure Paper Machines

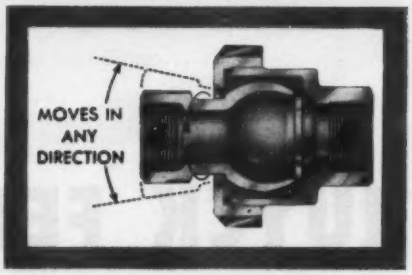
It is *costly maintenance* when you have to shut down a big paper machine to repair leaking steam and condensate lines connecting dryers with headers. This is why numerous mills and leading machine builders are now using Barco Flexible Ball Joints in assemblies with metal pipe as illustrated here.

At St. Joe Paper Company, Port St. Joe, Florida, Barco Flexible Ball Joints were first installed in 1951 to overcome connector failures in steam lines from headers to dryers on their No. 1 paper machine. They were so pleased with the results that in 1952 they equipped their No. 2 machine completely, using two joints to each of 102 dryers. But that isn't all. So far this year they have installed 217 additional joints of various sizes in headers and other piping—all because of the maintenance-free performance of Barco Joints.

St. Joe maintenance engineers say, "Barco Flexible Ball Joints have eliminated connector failures on our machines and we have had practically no maintenance whatsoever."

Barco has been solving piping movement problems since 1908. If you have a problem, our field engineers are available without obligation.

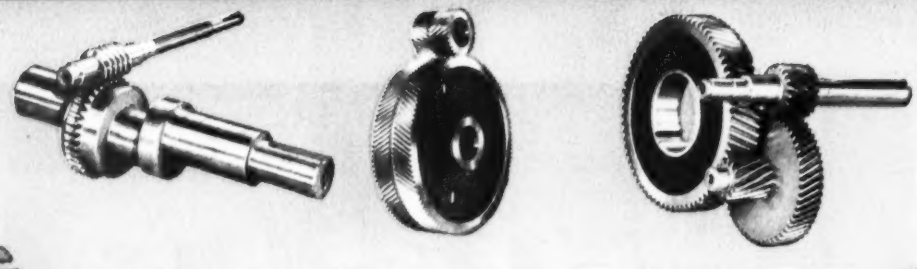


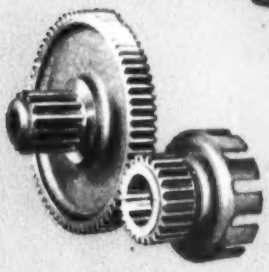


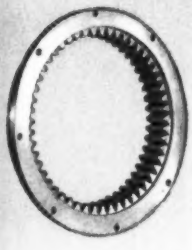
BARCO *Manufacturing Co.*

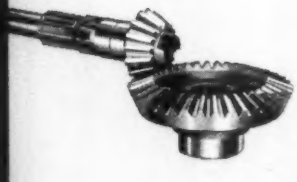
526E Hough Street • Barrington, Illinois

In Canada: The Holden Co., Ltd., Montreal



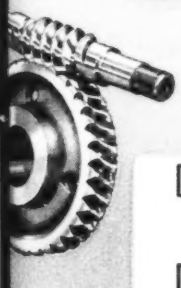






GEARS

America's most complete line of Gears-



From the modern plants of *Illinois Gear* come the most complete line of gears in America.

Whatever the requirement . . . spur, bevel, helical, herringbone, worm and worm gears, spiral bevel gears, etc. . . . look to Illinois Gear to fill your needs.

Consider too, the wide ranges of sizes available . . . from gears weighing as little as one ounce to those weighing 100,000 pounds per gear.

Regardless of the service, whether it's gears for rotating massive shovels, or gears that control delicate precision equipment, choose from America's most complete line of gears.

Look for this mark ILLG® ***the symbol on finer gears***

ILLINOIS GEARS
Reg U S Pat Off

Gears for Every Purpose ... **one gear or 10,000 or more**

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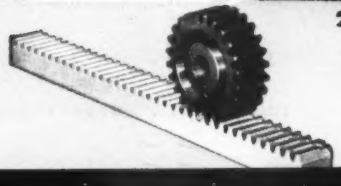
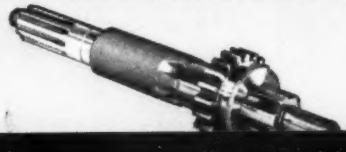
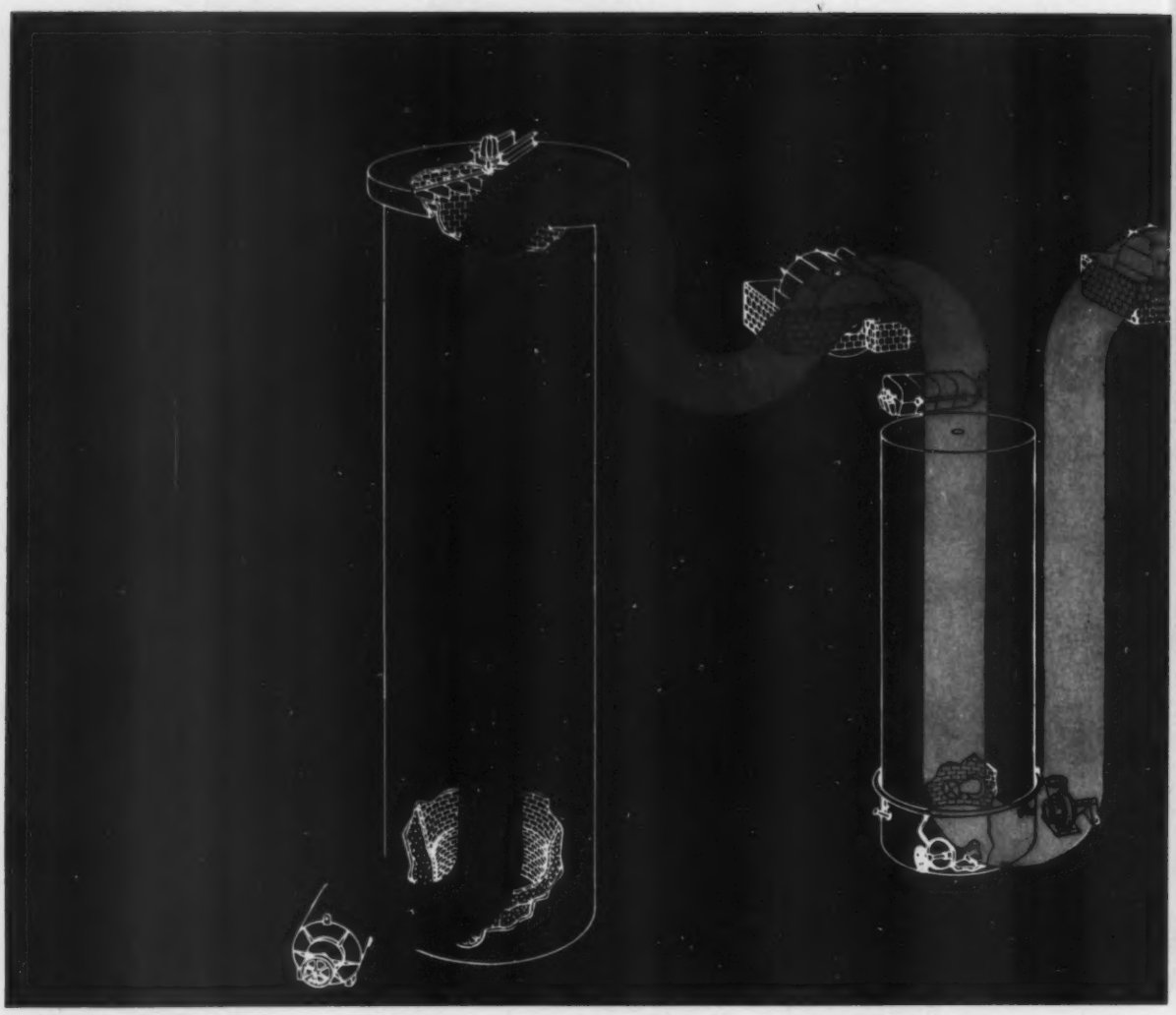


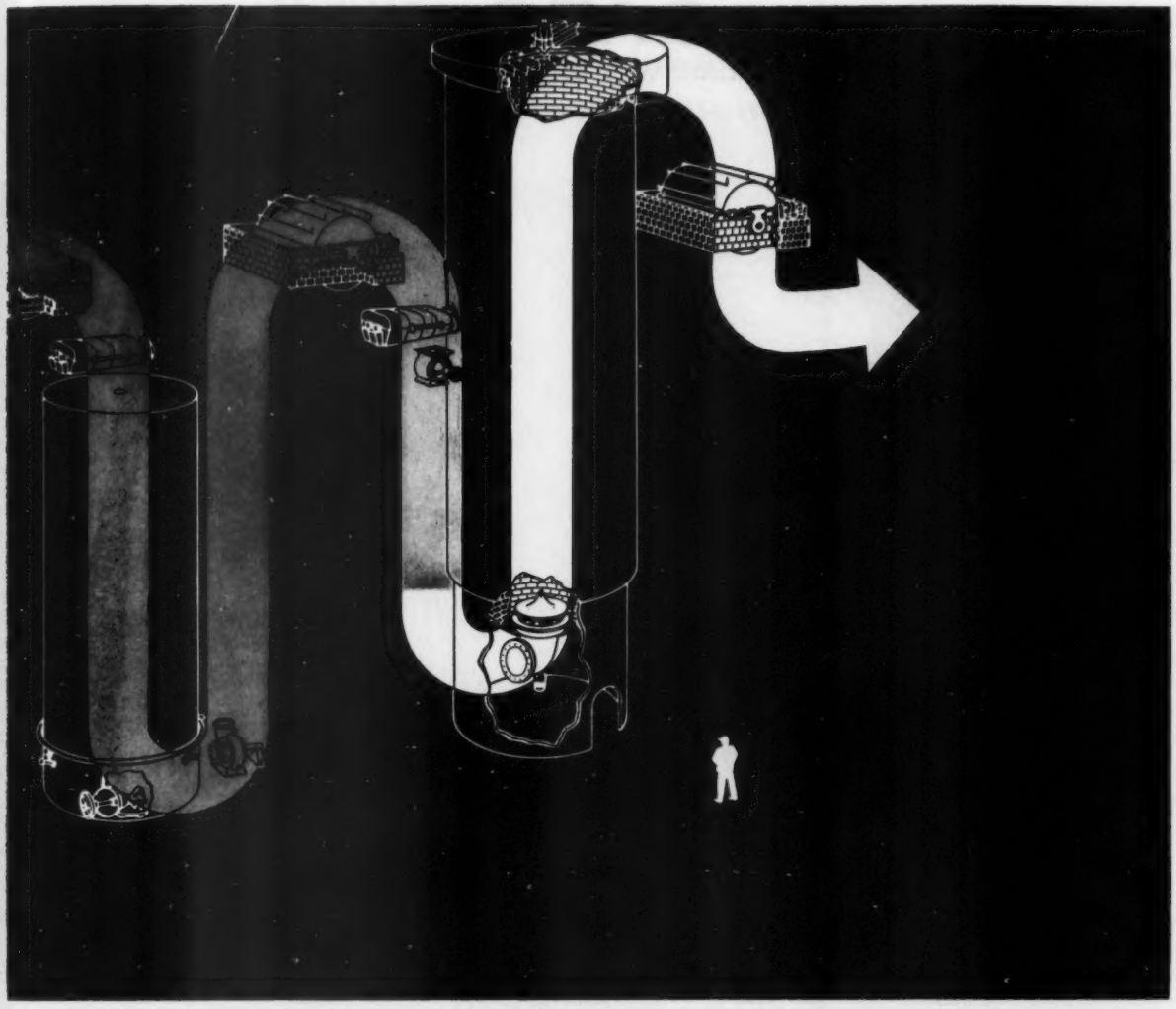




The continuous bleaching system that convinced

Only the KAMYR System gives you this combination of features

- Kamyr's Upflow High Density Tower design eliminated the flashing off of CLO_2 gases.
- Kamyr Radial Flow Mixers produce thorough mixing of stock and chemicals even at high consistencies.
- Kamyr solved the corrosion problem due to the use of chlorine dioxide by employing high grade alloys.
- Kamyr's pre-impregnation of high density pulp is recognized as ideal for high grade dissolving pulp.
- Kamyr's Upflow chlorination tower was the pioneer in its field, is production-proven.
- Kamyr dilution nozzles are automatic.
- Kamyr Vacuum Washers feature automatically loaded vacuum breaker, perforated plate deck and sloped central tubes for pick-up of the pulp sheet at low stock level.
- Kamyr achieved the intense mixing required for chlorine gas in the tower bottom.
- Kamyr's circulation pumps, stainless steel and rubber lined, withstand the corrosive attacks of chlorine.



178 pulp mill operators!

Proven capacity to produce superior quality, bright and strong pulp has led to installation of the KAMYR Bleaching System in more mills throughout the world than any other type. This preference reflects the leadership of KAMYR in important inventions and engineering achievements which have become the standards of modern bleaching methods.

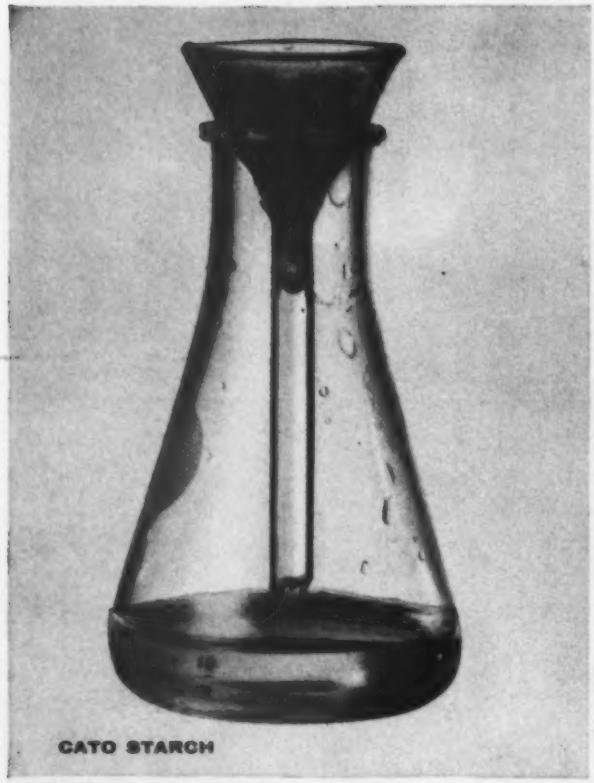
The patented KAMYR System is controlled and produced exclusively for U. S. mills by the Sandy Hill Iron & Brass Works.

Far ahead of the field in operational advantages, KAMYR can make a worthy contribution to your pulping facilities. WRITE TODAY FOR THE SANDY HILL — KAMYR BLEACHING BULLETIN #202.

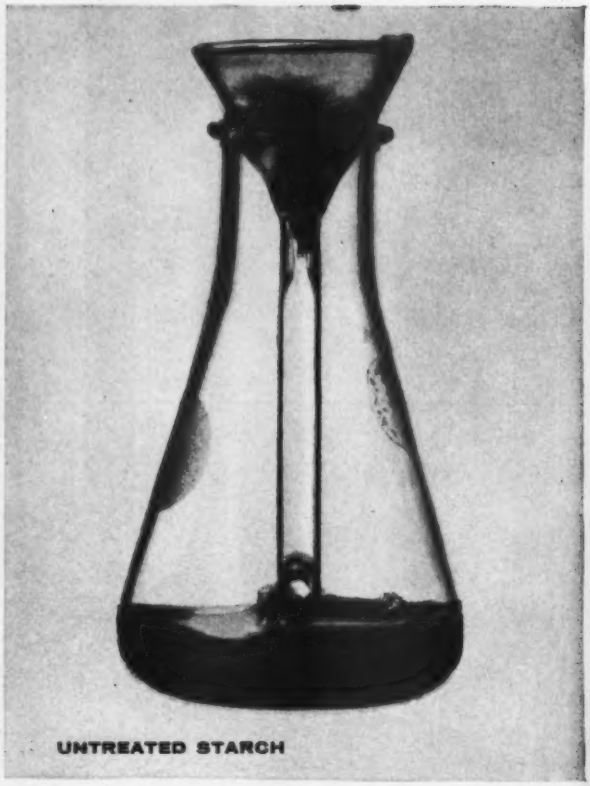
THE
SANDY HILL
IRON AND BRASS WORKS
HUDSON FALLS, N. Y.

CATO

CATIONIC WET END ADDITIVE



CATO STARCH



UNTREATED STARCH

IODINE TEST confirms greater starch retention

A simple experiment. Add ½ % (based on the weight of the dry fiber) each of cooked Cato and untreated starch to equal portions of fiber at ½ % consistency. Stir. Pour into microfunnels. Allow liquid to filter through fibers. Add drops of iodine to both sets of fibers and filtrates.

What happens?

The blue of the iodine test for starch dramatizes the much greater affinity of Cato to fibers—due to its cationic molecular structure. Showing Cato virtually 100% retained on the fibers.

This is why smaller amounts of Cato give greater internal strength and improved formation in wet end additions. Cato is effective with sulfite, soda and groundwood pulp as well as with kraft and reclaimed stocks.

National

STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

result of an engineer's good common sense

Pre-fabrication saves time, space and money when B&W Seamless Welding Fittings are used!

The engineer on this job knows his business. He specified B&W Seamless Welding Fittings and arranged for pre-fabrication. Think of the time, space and money he's saving management.

And there's no question of the pre-fabricated sections fitting when they're ready to be installed, because they're dimensionally accurate. Full radius, true circularity and smooth walls of exact thickness permit fast alignment and easy fit-up.

This time, specify B&W Seamless Welding Fittings for a permanent, leakproof piping system. Seamless Welding Fittings allow piping to nest closer, are stronger, yet weigh considerably less than other types of fittings. They're available in a complete range of sizes and types in carbon and the B&W CROLOYS.

THE NATURAL SOURCE FOR ALLOY FITTINGS

B&W TUBULAR PRODUCTS DIVISION

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION • FITTINGS DEPARTMENT
3839 WEST BURNHAM STREET • MILWAUKEE 46, WISCONSIN

FA-7905-FE

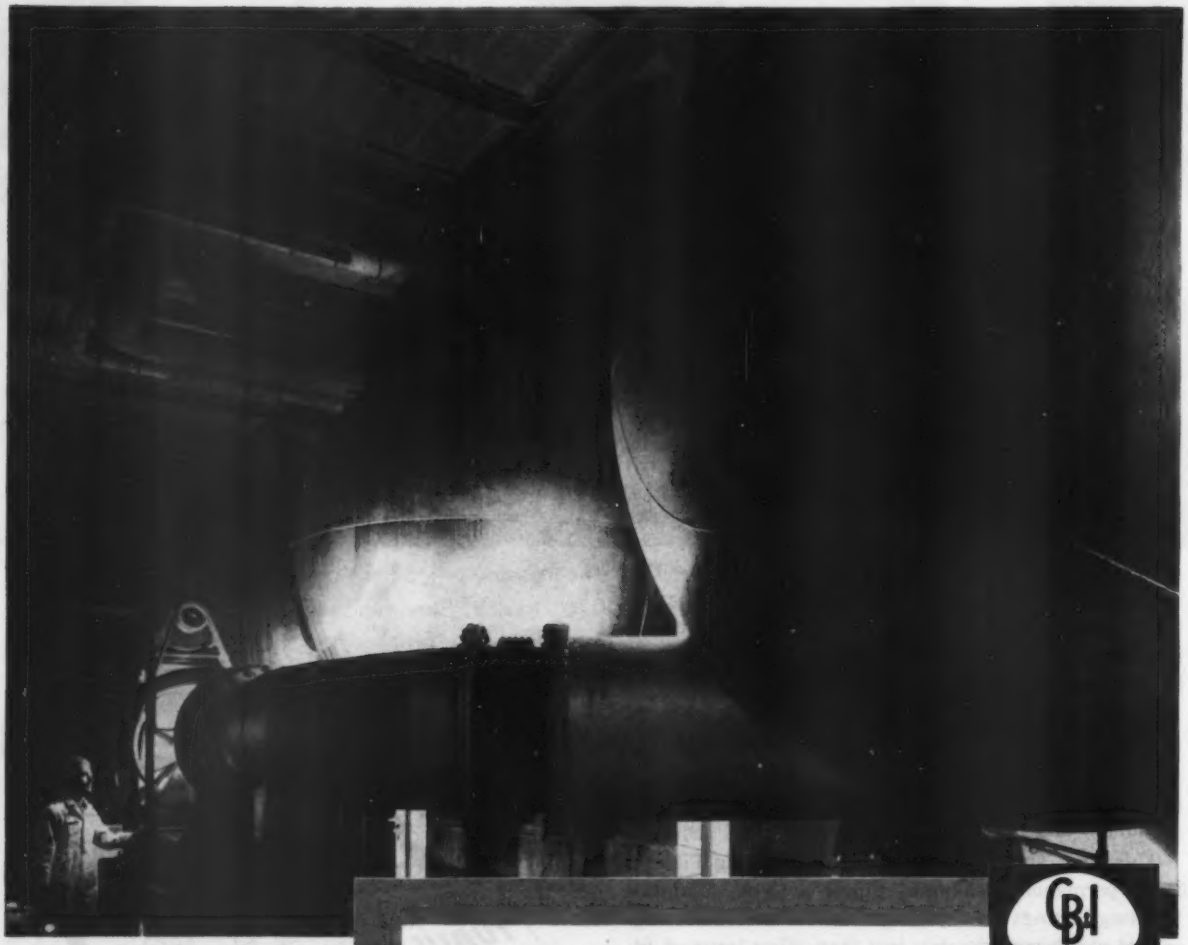
Seamless welding fittings and forged steel flanges, seamless and welded tubular products — in carbon, alloy and stainless steels.

CB&I

Builds Dump Chests Used In Sulphite Recovery Process

At the Weyerhaeuser Timber Company's plant at Longview, Washington, these four welded steel dump chests were installed as part of a sulphite recovery process. The structures, fabricated by Chicago Bridge & Iron Company, receive pulp which is washed from the digesters by sulphite waste liquors. The chests are protected on the inside by acid-resistant linings.

These structures illustrate the skilled workmanship CB&I employs in fabricating and erecting spherical structures.



16-ft. diam. by 71-ft. long chests supported by two ring girders spaced 37-ft. apart. The base of one girder on each vessel is fixed, the other moves as the shell expands and contracts.

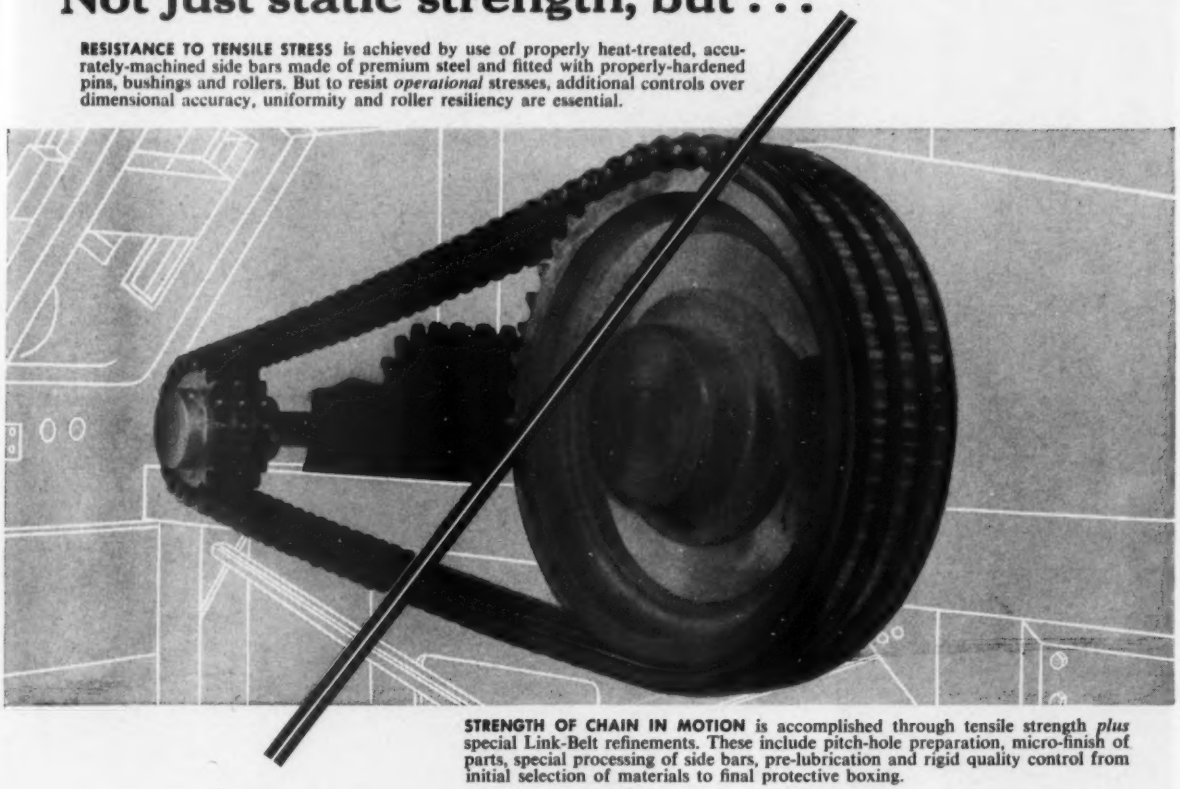
CB&I

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

Not just static strength, but . . .

RESISTANCE TO TENSILE STRESS is achieved by use of properly heat-treated, accurately-machined side bars made of premium steel and fitted with properly-hardened pins, bushings and rollers. But to resist *operational* stresses, additional controls over dimensional accuracy, uniformity and roller resiliency are essential.



STRENGTH OF CHAIN IN MOTION is accomplished through tensile strength *plus* special Link-Belt refinements. These include pitch-hole preparation, micro-finish of parts, special processing of side bars, pre-lubrication and rigid quality control from initial selection of materials to final protective boxing.

dynamic strength

assures longer work-life for LINK-BELT Roller Chain

In addition to known tensile loads, roller chain in motion is frequently subject to other operating stresses. Engagement with sprockets . . . shock of starting loads . . . centrifugal loads—there are many similar stresses.

Link-Belt's solution: greater dynamic strength, achieved through design, manufacturing and processing "extras" . . . plus a combination of other important refinements. And you see the results in smoother, more efficient performance that lasts measurably beyond the life of ordinary roller chain—cuts your drive and conveying costs.

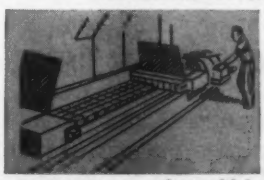
Near you is a Link-Belt office or authorized stock-carrying distributor where you can get full information on the complete Link-Belt range of single and multiple widths, ¼ to 3-inch standard pitch, and 1 to 3-inch double pitch. Ask for your copy of 148-page Data Book 2457.

LINK-BELT

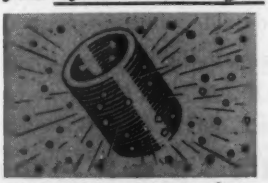
ROLLER CHAIN & SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,121

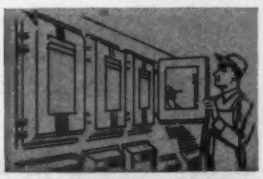
LINK-BELT gives you dynamic strength that comes from these important EXTRAS



PRE-STRESSING of multiple width chain provides uniform load distribution.



SHOT-PEENED ROLLERS have greater fatigue life, added ability to withstand impact.



CLOSER HEAT-TREAT CONTROL —coupled with rigid testing insures uniformity.

LOCK-TYPE BUSHINGS (applied on a range of sizes) end a cause of stiff chain.

TITANOX* gives paper a bright new look

The remarkable optical properties of TITANOX white pigments are most aptly illustrated by their use in paper. To increase brightness and opacity of wax papers . . . to increase legibility in printing papers by reducing show-through . . . to eliminate dull backgrounds in packaging stocks . . . or simply to give a bright new look to paper cups—TITANOX is your first choice in titanium dioxide white pigments.

Our Technical Service Department will be glad to discuss with you the best use of TITANOX. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices in principal cities.

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

4788

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

CAMERON 460
a new high-speed winder

...speeds up to 5000 fpm
...quick-set shear-cut or score-cut slitting
...widths to suit requirements
...maximum rewind capacity 72"
...automatic riding roll lift
...automatic rewind shaft lift
...automatic roll ejector *

Send for free Bulletin 3030

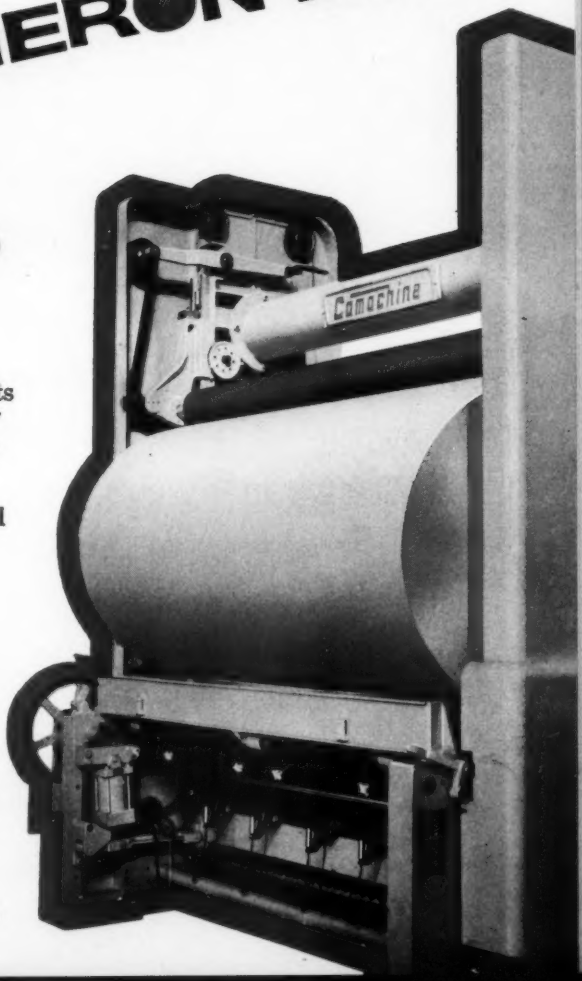
2 great new CAMERON winders

CAMERON 430
a new slitter-rewinder

...speeds up to 3000 fpm
...score-cut or shear-cut
...widths to suit requirements
...maximum rewind capacity 60"
...automatic riding roll lift *

* optional

Send for free Bulletin 3035



CAMERON MACHINE COMPANY • 61 Poplar Street • Brooklyn 1, N.Y.

460 and 430...two highlights in Cameron's sweeping new design program...setting new highs in production of quality rolls, new lows in operating cost...featuring dynamic new engineering developments by Cameron's

team of specialists

AA-329

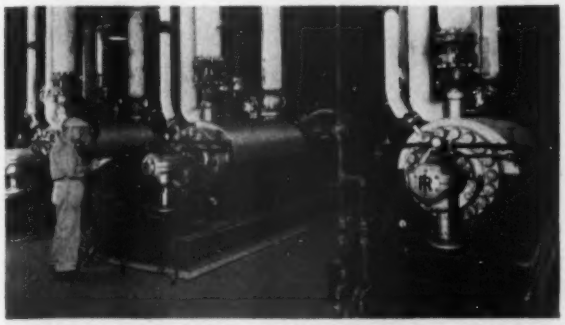
This man is going to school . . . but he'll never graduate. He's the Appleton man who calls on you and he comes here periodically to learn the latest technological developments in felt design and manufacturing. This helps him to better help you find the answers to your felt application and performance problems. Talking felts with the Appleton man can be a rewarding experience. Appleton Woolen Mills—*a working partner with the paper industry* — Appleton, Wisconsin.

Appleton felts

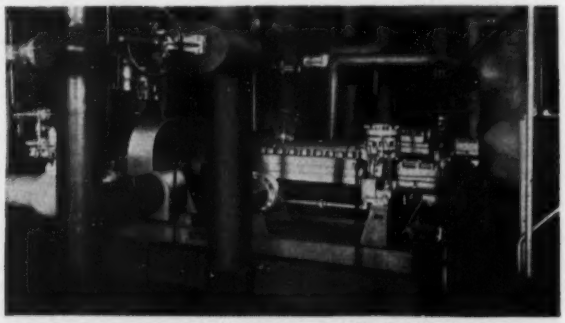
BOILER FEED PUMPS GIVE DEPENDABLE PERFORMANCE

at all pressures, capacities, temperatures.

Typical I-R installations indicate wide range of use in central stations and industrial plants

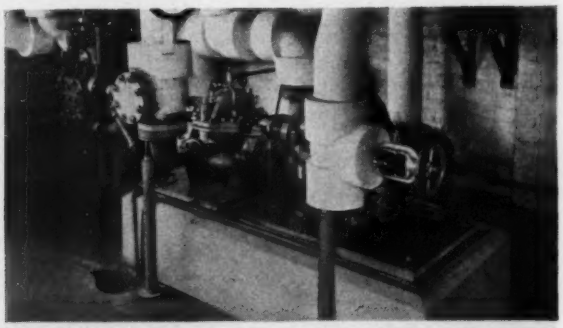


PRESSURES UP TO 6500 psi.—Class CHTA-CHTB: These multi-stage, cylindrical "double-case pumps meet the most exacting needs of the highest-pressure boilers in modern central station service. Each of the above pumps handle 1100 gpm of feedwater at 2395 psi.



PRESSURES UP TO 1200 psi.—Class HMTA-HMTB: A complete line of multi-stage centrifugal pumps featuring a symmetrical, horizontally-split casing, and a simplified unit-type rotor assembly. The pumps illustrated are on boiler feed service in a large textile mill.

MEDIUM PRESSURES UP TO 1000 psi.—Class CNTA: Symmetrical design with unit-type rotor gives CNTA pumps higher efficiency, easier maintenance, and attractive modern appearance. Installed in a large paper mill, the boiler feed pumps shown operate at 3560 rpm and deliver 180 gpm at 605 psi.



PRESSURES TO 450 psi.—Class GT: Dependability is designed into this line of two-stage, horizontally split pumps. Standard construction includes renewable wearing rings and water-cooled, ring-oiled bearings. Pump shown serves as a boiler feed unit in a large candy factory.

PRESSURES TO 250 psi. — Motorpumps: A complete line of space-saving centrifugal pumps, including both close-coupled and cradle-mounted types. Single , two-stage, and vertical four-stage models are available. Pump shown is handling boiler feed in a leather factory.

Ingersoll-Rand boiler feed pumps have many refinements in design and construction that add up to high operating efficiency. Skilled manufacture and painstaking factory inspections assure dependability built into every pump. Inherent simplicity and ruggedness mean easier and less maintenance—and trouble-free performance.

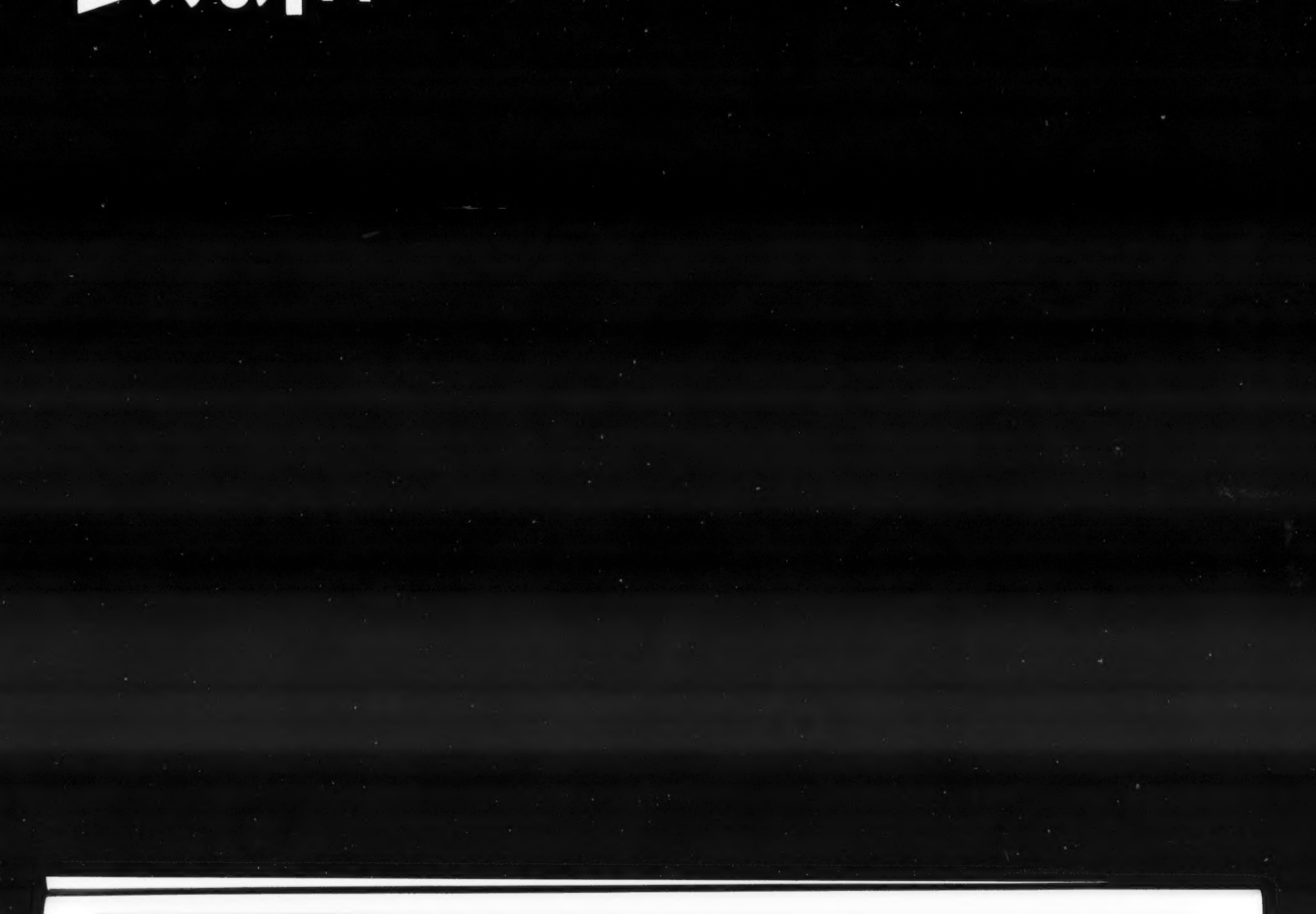
Whatever pressure or capacity you need, Ingersoll-Rand can supply a boiler feed pump for the job. I-R engineers will gladly help you select the pump that meets your needs.

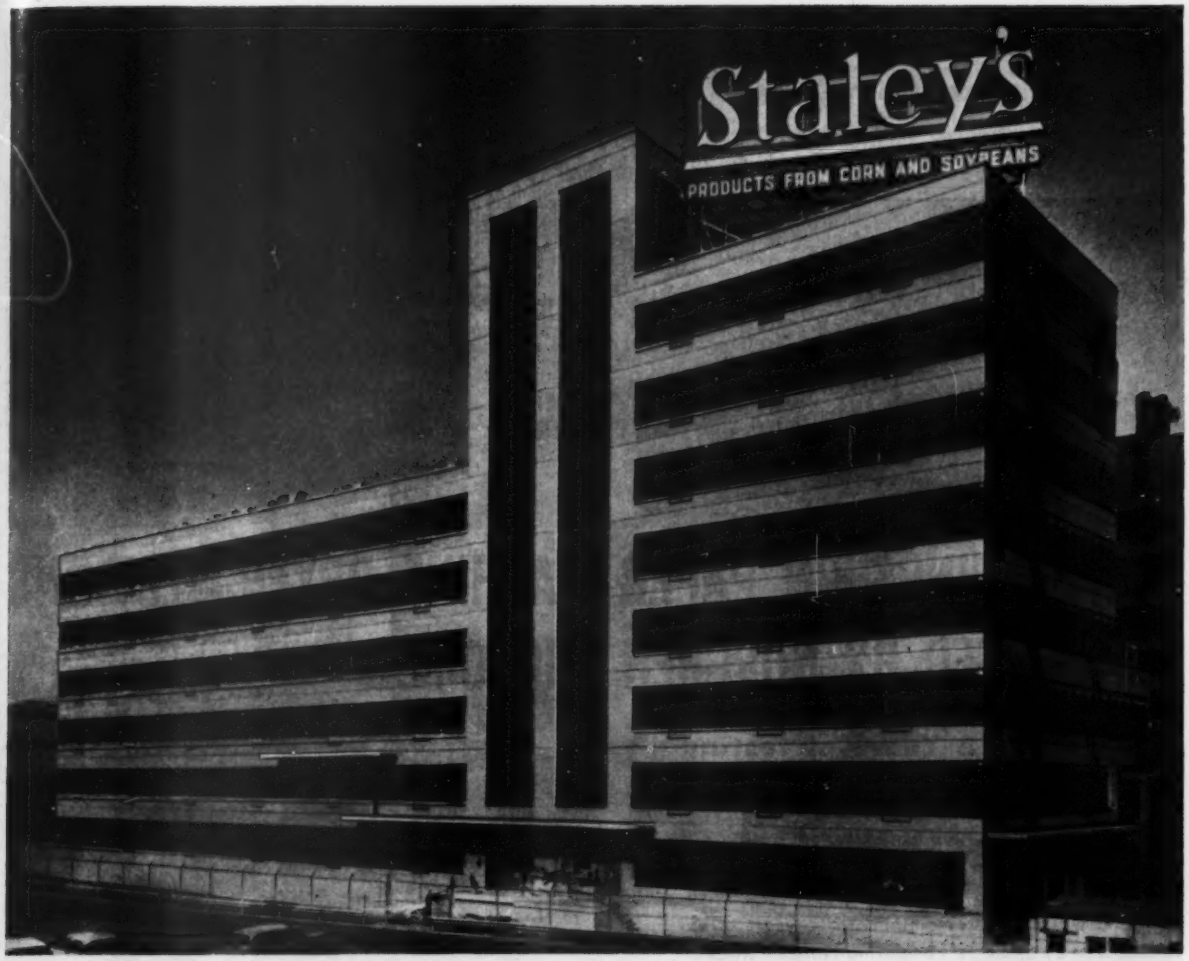
Ingersoll-Rand

10-380 **11 BROADWAY, NEW YORK 4, N.Y.**

COMPRESSORS • GAS & DIESEL ENGINES • AIR & ELECTRIC TOOLS • CONDENSERS • PUMPS • ROCK DRILLS • VACUUM EQUIPMENT

Hold Your Fire...
WEYERHAEUSER



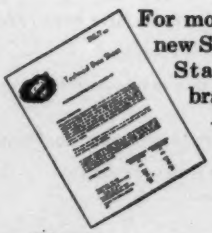


New continuous process drier plant produces Stayco® starches...improved in uniformity, dispersibility, color

The well-known STAYCO line of oxidized starches, long a quality byword in leading mills, is now better than ever!

The reason? Staley's new multi-million dollar addition to its continuous starch drying facilities just recently put into operation, is the model of the industry—incorporating the latest technical advancements in production and control.

The result? STAYCO starches of greatest purity—improved color—reduced ash content—increased uniformity—better dispersibility. Just five of many ways Staley's can help you produce better paper *from furnish to finish.*



For more information on new STAYCO, call your Staley man at the branch nearest you —or write to Staley's, Decatur, for Technical Data Sheet.

Staley's

A. E. Staley Mfg. Co.,
Decatur, Ill.

Branch Offices: Atlanta • Boston • Chicago • Cleveland • Kansas City
New York • Philadelphia • San Francisco • St. Louis

From Furnish Stayco® To Finish

ST. REGIS PAPER CO.'s three-year tests proved Norgren MICRO-FOG best for lubricating the bearings on these paper machine dryer sections.

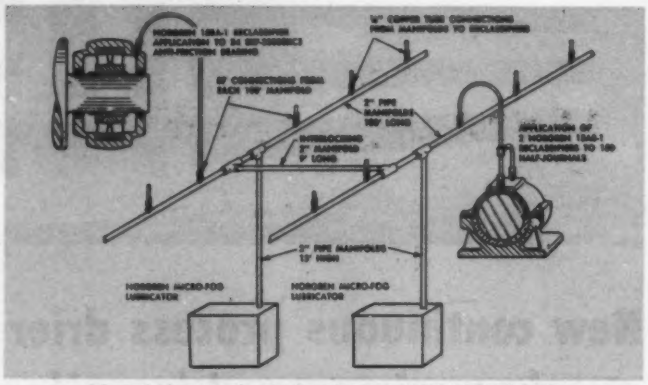
174 BEARINGS ON PAPER MACHINE DRYER SECTIONS LUBRICATED BY NORGREN MICRO-FOG

...Result of 3 Years of testing by St. Regis Paper Co.

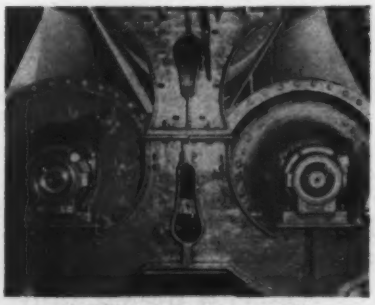
The block grease lubrication system for the 174 bearings on the dryer sections of this machine was inadequate, requiring supplementary hand lubrication, and was costly to maintain. Three years of extensive tests by St. Regis, comparing Norgren MICRO-FOG with other methods of lubrication, proved to them that MICRO-FOG is best. By changing to MICRO-FOG Lubrication, St. Regis gained the following advantages:

1. MICRO-FOG Lubrication is by far the most thorough.
2. Maintenance of lubrication system is easier.
3. Bearing temperatures have been reduced.
4. Less lubricant is consumed.
5. Paper losses due to excessive lubrication have been ended.
6. Lint and other contaminants can't enter bearings.
7. MICRO-FOG is easy to operate.

For complete information about this application, call your nearby Norgren Representative listed in your telephone directory—or **WRITE FOR BLUEPRINT MF-23.**



Schematic drawing, showing how Norgren MICRO-FOG Lubrication is conveyed to the bearings.



Anti-friction bearing at right shows how one MICRO-FOG distribution line serves each bearing. Note oil leakage at bearing at left where old lubrication system was used during test.

MICRO-FOG enters each plain bearing through two lubrication lines, providing a continuous protective coating of fresh lubricant over the entire surface of the bearing.

MICRO-FOG by NORGREN

C. A. NORGREN CO.

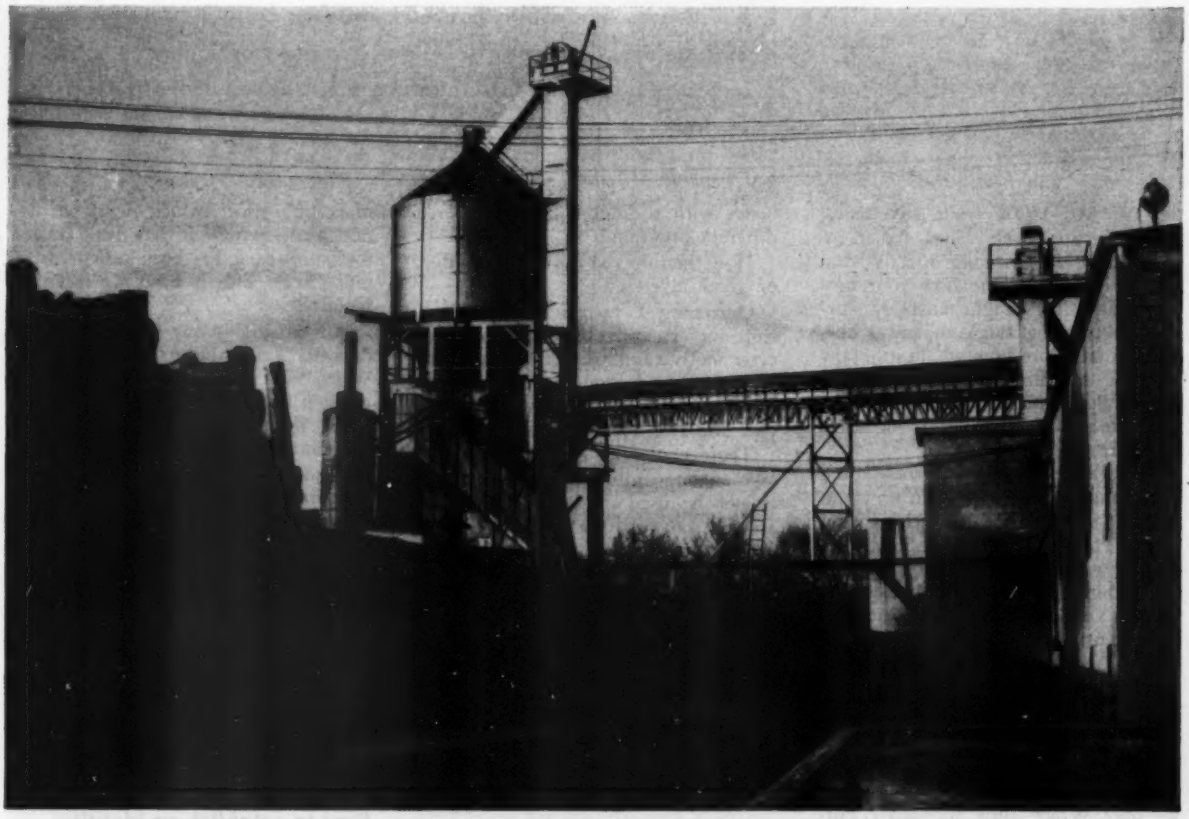
3455 SOUTH ELATI STREET • • • ENGLEWOOD, COLORADO

from log pond to beaters... Prairie State Paper Mills modernizes with JEFFREY Conveyors

From the time the pulpwood leaves the pond, it is hurried along by Jeffrey conveyors. Logs are pulled up the slide and through the barker by Jeffrey long-wearing chain, especially built for this rough service. A Jeffrey bucket elevator lifts the chips up to a Jeffrey belt conveyor which carries them across to storage.

In the plant where chemical treatment of the chips introduces a corrosion problem, Jeffrey stainless steel spiral conveyors are used. Thus maintenance is greatly reduced and there's no contamination of materials going into the beaters. These and other conveyors that follow are designed to handle 30 tons of cooked chips per hour.

Here's a case of a comparatively small paper mill being put on a basis where they can successfully compete with larger, highly mechanized mills. Jeffrey engineers excel in providing this kind of engineering service. The Jeffrey Manufacturing Company, Columbus 16, Ohio.



Conveying equipment for Prairie State Paper Mills, Joliet, Illinois, was designed to handle 64 tons of wood chips per hour, weighing approximately 40 pounds per cubic foot.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

Feature articles

The identity factor in industrial advertising*

C. W. KOHLMAN**

The most important function of advertising is to help build and maintain an identity — which is the most decisive factor in assuring a company's continued growth and prosperity.

SHOW ME HOW your advertising budget justifies itself? Show me an instance of a sale resulting directly from advertising? Show me how your promotional effort taught anybody anything about what our company is like, or what we do or how we do it? Show me how that direct mail campaign, or that catalogue or that method for handling inquiries really paid for itself in dollar and cents?

We are all familiar with these questions; and, let's face it, when we try to analyze the role of advertising and relate it to the general goal of making money, we find ourselves on quavering ground. In fact, it is difficult to recall a single instance where the only significant factor in making money is advertising.

It is just as difficult to prove that the campaign we selected and the way we ran it was right. How much or how little money should we spend on a campaign? Which media should we use? Which copy approach? Fortunately, success springs from doing a good job no matter which of alternative means are chosen. But who is to say it might not have been done even better with a different approach or a different program?

How then do you measure the effect of good advertising?

Our present yardsticks — readership surveys and rating methods and even motivation research — have all been tried and found wanting in the effort to evaluate full advertising impact and effectiveness.

These yardsticks are used to undertake an impossilby difficult task. They cannot be used effectively when you are asked to justify a budget.

Identity—an effective yardstick

In identity we have a yardstick against which we can measure success in any of the areas we have been discussing, if we use it intelligently.

What do we mean by identity? All companies, like all people, have a public image or personality or identity, whether they like it or not. The people with whom the company comes in contact, directly or indirectly, are continually making judgments about the entire company, its products, its executive image. This judgment is made on the basis of all the expressions and gestures the company is continually transmitting.

People buy from a company because of a number of reasons, not just one. This is the reason for today's total marketing effort, which is known under many terms. It has been called total impact, it has been called corporate image. This is what we mean by identity.

Advertising is one of the most influential contributors to identity. When it is consistent, it helps sales; when it is inconsistent, no matter how direct its purpose, it impedes sales. The most important function of advertising is to help create identity or to maintain it — and not to get too concerned with small immediate objectives.

Companies that stay in business and grow and prosper are those which not only build identities but live up to the identities they have established. By the same token, companies can go on the rocks because of a sharp disparity between promise and performance. People expect a continuity of identity and do not take to changes of identity easily.

How to establish an identity

The first step is to decide what your identity is—or ought to be. This is not usually a matter of intuitive judgment. Companies, like individuals, are not necessarily the best judges of their own personalities.

A company has no identity in and of itself. Identity means nothing ex-

*Abridged from a paper presented at a meeting of the Industrial Marketers of Detroit, January 15, 1957.

**Advertising manager, Industrial Chemicals Div., American Cyanamid Co.

cept in the eyes of someone else. The only way to find out what your identity is is to check with the people you are trying to reach. Finding your true identity is a job for unbiased and impartial excepts — usually by independent consultants who are thoroughly trained and experienced.

How does identity affect sales choice?

All advertising works, but in different ways. Sometimes advertising produces a direct result; sometimes it creates desire; more often it creates acceptance, and sometimes it helps prevent a negative attitude. Both consumer advertising and industrial advertising work in about the same way, but there is one all-important difference — and that is in their relation to salemen and their motivation of salesmen.

Much consumer advertising is predicated on the fact that salesmen are relatively unimportant. The principal job of a salesman is to fill the pipelines of distribution. How good a salesman he is depends upon factors other than getting orders, such as putting products on the right shelf, seeing that displays are installed, merchandising the advertising, even dressing the windows. Salesmen, in short, are the tools of consumer advertising; they help advertising.

Industrial advertising is different. Orders are larger and placed by a severely limited number of people. Here the salesman is all-important. Industrial advertising is designed to help him.

In short, in industrial advertising, advertising helps the salesman; in consumer advertising, the salesman helps the advertising. While this may be an over-simplification, and while there are exceptions, the basic point remains that the principal difference between consumer and industrial advertising is in their relation to the salesmen.

In both consumer advertising and industrial advertising, however, identity is the most important factor that affects sales choice. People do not buy because they are impelled to do so by a single ad. No matter how good an ad is, it will not do the whole job.

There are numerous examples of outstanding identity in the consumer advertising field. Some industrial firms are doing a fine job of building their identity through consumer media, but is there an instance where an industrial advertiser has carried his identity effectively into his direct mail or industrial trade magazines?

In our efforts to help our salesmen, is it possible that we are using industrial advertising only as a sort of catalogue listing of our products and their technical specifications? Do we think that, because we have a consistent approach, we have identity?

Because in industrial advertising we know the ultimate sale is made by our salesman, we have been trying to make our industrial advertising do too much. We seek to prove that advertising can do the whole selling job. This has hampered, in my opinion, the efforts of industrial advertisers to establish identity.

The new marketing concepts put everything together to achieve total impact, to project a consistent and total image and identity.

The question of who produces an order, or the degree of responsibility as to what produces an order, or whether advertising is good on the basis of inquiries produced is relatively unimportant.

What is important is that we recognize increasingly that marketing is total effort; that it is total identity that produces orders, and that in this total identity the two most important factors are advertising and the product.

Identity in direct mail, catalogues and inquiry handling

The three factors — direct mail, catalogues and inquiry handling — do not produce a customer as such but produce a final impetus to action. They represent the trigger action; they fire the gun. Since it is an attitude of mind you have to change or strengthen to consumate the sale, you want to make sure that your trigger is of the same design as the gun you have been showing — so your customer can pull it without stopping to admire the difference.

If identity is important to advertising as a whole, it is particularly important for these three factors, because they are closest to action. They are closest to identity. If you change your identity at this point, you confuse your customers.

A good deal of direct mail — more than we recoginze — travels a rapid route across a man's desk into the waste paper basket. Even when it does that, it ticks off in his mind a subconscious recognitition of the company that sent it. The smart salesman tries to make each cross-desk tour a fleeting personal call. He does this by identifying himself strongly with the advertising and direct mail which are the only other visages of his company that most of his customers ever see.

Sometimes, since they know why it works, our salesmen show a direct mail piece to the prospect shortly after they walk into his office — even if only to say, "Have you seen this?"

If the salesman uses advertising literature when he wishes to change the topic of sales conversation, if he uses printed pieces to prove his statements, if he does almost anything at all with sample direct mail pieces, he is helping himself and his sales by identifying himself with future mailings.

In catalogues, identity comes closest to the salesman. The catalogue is for the man who is thinking of purchasing. At the moment when a prospect is looking for a product he is provided with several potential sources of supply.

When the prospect sees our name in the catalogue, our identity should be so favorably established that the prospect selects our company as the one to call. Seldom does one call an unknown name in the telephone Red Book. The customer calls a name that is familiar — or he thinks is familiar, or a name that has a big or impressive ad on the page.

Our salesman should be identified with the catalogue. He should be so well known that the customer will think of him when he looks at the name of the company. We have suggested that each of our salesmen borrow the catalogue while in a secretary's anteroom and write his name on our ad. To every extent possible, we avoid the prospect saying, "Let's see, what's the name of that Cyanamid salesman?"

The handling of inquiries can become important if it is handled in such a way as to establish salesman identity. Inquiry-answering must be done in such a way as to maintain the identity of the company and to make salesmen accede to the identity of the company — as courteous, as complete in answer, yet to the point, as prompt in reply as our advertising departments are in their responding.

Total identity, like total marketing, should not be confused with conformity. It does not mean that everybody has to sit around and nod his approval to everything. The idea that "everybody must stay in line" and "give this image, and this one only" is completely wrong. By total identity we mean quite the reverse. You must be original, creative — but all within the total picture you want.

Most importantly, be careful not to create an identity to which you are unable to live up. Calvin Coolidge in an Indian headdress is not good identity. You cannot dare to be anything but genuine. For any lasting performance, your identity must be related to the facts. If you must change your identity with circumstances, better make sure your new identity is something you are not contradicting on another front.

How Charmin Paper makes Torula yeast

A. W. J. DYCK

Optimum yeast growth is maintained in the fermentation tank by keeping the contents in a 50 per cent air-emulsion state.

The first full-scale Torula yeast plant built by Charmin Paper Mills Inc. has sufficient capacity to process all the company's sulfite liquor into 5000 annual tons of high-quality protein product.

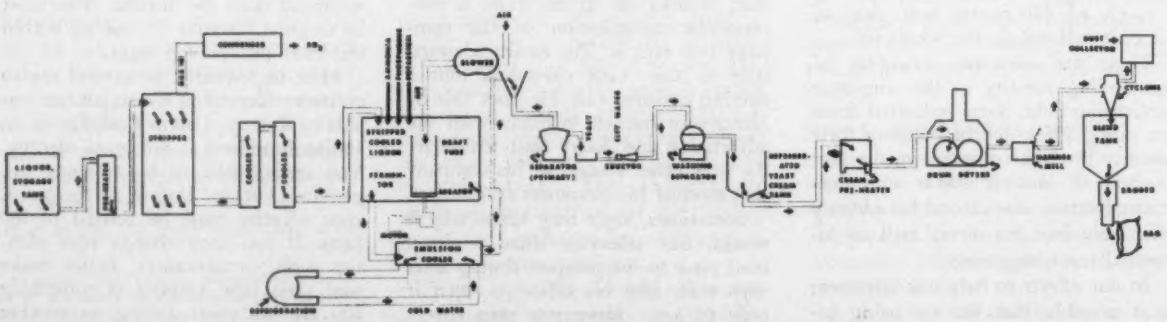
TORULA YEAST as a rich and economical source of protein and vitamins has intrigued the imagination of nutrition scientists for many decades. With the development of methods that permit the utilization of the sugars in sulfite liquor as a food for Torula yeast, this important source of high-quality and easily assimilated protein has now become a reality.

Torula yeast is grown commercially in the largest and most modern yeast plant in the world erected at Green Bay, Wis., by Charmin Paper Mills Inc. Production is continuous in a stainless steel system, with every stage of the process—from culture of the Torula strain to automatic packaging—scrupulously and hygenically controlled.

The total output of the Green Bay plant, amounting to 5000 tons per annum, is marketed by Red Star Yeast & Products Co., Milwaukee, who has recognized the nutritive value of this product as a food and pharmaceutical supplement.

The process

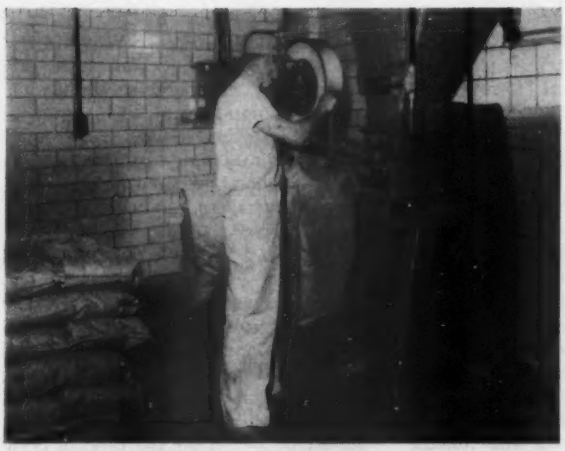
The process of manufacturing Torula yeast from sulfite liquor is relatively simple (diagram). It begins with the 125,000 gal. liquor storage tank which is supplied from the sulfite mill collection system. Composed mainly of wood sugars (which constitute about 10 per cent of the dry weight of the wood), sulfur dioxide and lignin, the liquor is pumped from the storage tank to a preheater where its temperature is raised to 175°-180° F. At this temperature the liquor is



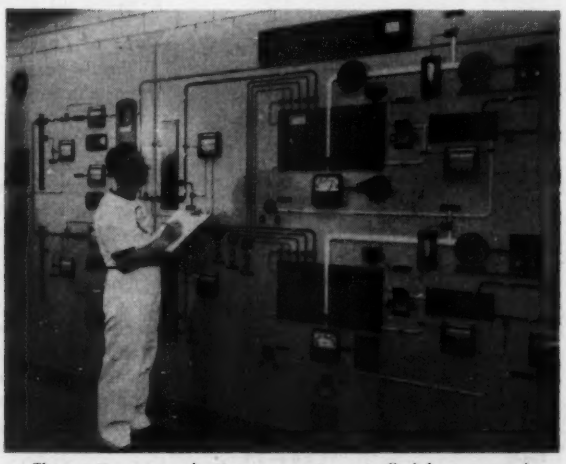
Flow sheet of the Torula yeast manufacturing process

View of the stainless steel fermentation tanks and separators.

The yeast cells are killed and dried on drum dryers.



Free-flowing yeast is packaged mechanically by a bagger.



The continuous production process is controlled from a panel.

freed of its sulfur dioxide in a stripper under a pressure of 0.5 atmospheres. The sulfur dioxide is reclaimed in a condenser for reuse in the pulp mill.

From the stripper the sulfur dioxide-free liquor flows to coolers where the temperature is reduced to about 90° F.

From the coolers the liquor goes to the fermentation tank, made of stainless steel, in which the actual growth of the yeast cells occurs. To the fermentation tank are also added continuously a number of inorganic nutrients, i. e. ammonia, phosphoric acid and potassium chloride. Air, pumped at the rate of 3000 cfm through the agitators in the tank keeps the contents in a 50 per cent air-emulsion state, thereby providing the necessary supply and distribution of oxygen for the metabolism of the extremely rapidly growing Torula organisms.

Growth in the fermentation tank is so rapid and the metabolic rate of the microorganisms so high that the air-emulsion has to be pumped continuously through an emulsion-cooler capable of removing heat equivalent to 7,000,000 B.T.U.'s per hour.

The refrigeration unit of the emulsion-cooler is operated by a 600-hp motor and handles 10,000 gal. of emulsion per minute.

Average time of the yeast organism in the fermentation tank is about 3-3½ hours.

The contents of the fermentation tank are drawn off continuously and pumped to the distribution header. The yeast is then refined to a very high degree of purity in a series of washing and concentration operations through nine separators. The concentrated yeast goes to the holding tank, which is cooled to 60° F. From here it is passed through preheaters prior to going to large rotating drum dryers where the water is evaporated and where the yeast organisms are killed.

From the drum dryers, the yeast emerges in the form of a dry sheet. Hammermills reduce this to a powder of fine particle size. The free-flowing powder from the hammer mills is collected in a blending tank.

From the blending tank, the yeast is fed to the bagger, where it is packaged mechanically for delivery and distribution by Red Star Yeast.

Nutritional value of Torula yeast

The high nutritional quality of Torula yeast is evident from the following tables, as reported by Red Star Yeast & Products Co.:

Tables Showing Approximate Nutrition Values of Dried Torula Yeast U.S.P.

Vitamin Content	Micrograms per Gram
Thiamine	120 — 150
Riboflavin	45 — 65
Niacin	500 — 650
Pantothenic acid	55 — 65
Pyridoxine	25 — 35
Para-amino-benzoic acid	10 — 15
Folic acid	20 — 25
Biotin	0.5 — 1.0
Choline	2500 — 3500
Inositol	3500 — 4500

Protein

Minimum 50% (% N × 6.25)

Ash

Maximum 8%

Moisture

Maximum 7%

Amino Acids	Per Cent On As Is Basis
Arginine	3.6
Cystine	0.7
Glutamic acid	6.9
Glycine	0.2
Histidine	1.3
Iso-leucine	3.8
Leucine	3.6
Lysine	4.1
Methionine	0.8
Phenylalanine	2.4
Threonine	2.6
Tryptophane	0.7
Valine	3.0

Bacteriological Analyses

Bacteria count does not exceed 7500 per gram.

Mold Analyses

Mold count does not exceed 50 per gram.

Mineral Content	Parts per Million
Iron	155 — 165
Copper	15 — 17
Manganese	32 — 34
Aluminum	25 — 27
Zinc	122 — 127
Lead	1.3 — 1.5
Cobalt	0.03 — 0.05
Nickel	1.5 — 1.7
Iodine	2.0 — 3.1
Chloride	0.25 — 0.35

Mineral Content	Per Cent
Potassium	1.80 — 2.20
Sodium	0.01 — 0.02
Calcium	0.85 — 0.95
Phosphorus	1.50 — 1.90
Magnesium	0.15 — 0.25
Silicon	0.04 — 0.06
Sulfur	0.50 — 0.80

The tables show that Torula yeast is an excellent source of all members of the B-vitamin group. Moreover, coming from a natural source, these members of the B-complex vitamin group are present in a well-balanced proportion.

The protein content of Torula yeast (amounting to a minimum of 50 per cent) is high. An analysis of the amino acids constituents of the protein fraction shows that all of the essential amino acids are present in the yeast, and that all amino acids, including non-essential amino acids, are available in good supply.

Uses of Torula yeast

Torula yeast is in its infancy as an important food product. However, already large tonnages are going into three closely related fields of consumption. It is reasonable to assume that many new uses, and in continuously increasing demands, will be found for this product.

The bulk of the output is now used by makers of animal feeds. It is used on a large scale in feeding poultry, meat animals, fur-bearing animals and even hatchery fish and honey bees. Technically, it is considered a feed supplement, because it is added in relatively small proportions to raise the nutritional values of the bulkier cheaper materials in the feed itself.

It is reported that a lion cub born in a zoo has grown to healthy maturity on a mixed meat-free diet in which Torula yeast supplied the essential elements lions normally get from eating raw meat. Ranch mink now thrive, seven months of the year, on dry diets fortified with Torula yeast. They receive a meat and fish diet for five months of the year only while producing and suckling their young or while being prepared for pelting. State conservation departments report that hatchery trout grow faster and survive better on Torula-rich diets, at substantial savings of feeding expense.

Continuously increasing quantities of the U.S.P. grade of Torula yeast are used for human food and pharmaceuticals. Its bland taste makes the yeast an excellent carrier of flavors, such as hickory and various sausage flavors.

Incorporated into food or pharmaceutical products the U.S.P. grade enhances their nutritive and marketing value. It is especially recommended for incorporation into such products as bread, crackers, cookies, baby foods, spaghetti, macaroni, canned meats, gravies, soups, prepared mixes, puddings, beverages, candy, ice cream, cereals, dietetic foods, vitamin compounds and many pharmaceutical products.

The acceptance of Torula yeast is bound to grow as people become familiar with its high protein nutritional quality and as new applications are discovered. All indications are that it is destined to play an increasingly important role in the nutrition of both men and animal.

Organic coatings for paper

Part XII — Polyamide resins

▶ Polyamide resin films provide effective barriers to both water vapor and grease as well as good resistance to chemicals; films of polyamide-epoxy resin combinations show unusually high gloss.

POLYAMIDE RESINS are condensation polymers of di- or polybasic acids with di- or polyamines. The most widely known polyamide resin is Nylon, which is a condensate of dibasic acid such as adipic or sebacic acid with diamines such as hexamethylene diamine. The melting temperature, however, is too high and solubility too low to permit the use of Nylon in conventional coating applications.

Applications

Fortunately, polyamide resins with lower melting temperatures than Nylon are available. The lower-melting polyamide resins which are of interest to the paper converter are based on the condensation of dimerized vegetable oil acids with diamines such as ethyl-

ene diamine. Several grades of these polymers are produced which differ so widely in physical properties that, by blending them, products ranging in melting temperature from 30-180° C are available. These may be used either alone or in combination with epoxy resins. The polyamides which are used alone for paper coatings are hard, amber colored substances. They may be applied to paper either from solvent solutions, as hot melts, or as water dispersions known as polyamide resin suspensoids.

The water dispersions, or resin suspensoids, form discontinuous films on paper. Continuity of the films can be achieved by fusing the films at temperatures in the region of 110-120°C.

Hot melt applications are relatively easy, since the resin's viscosity decreases rapidly as the temperature rises above the melting point. This enables a coater to produce a beautiful heat glaze. The resins are sufficiently stable to make possible hot melt applications by normal procedures.

Most of the polyamide coatings are applied as solutions. Isopropyl alcohol is a good solvent, especially if used in combination with an aromatic solvent, such as toluene or xylene. Solutions containing 40-50 per cent of the resin may be prepared using these solvent mixtures.

Some polyamides have a tendency to set up to a gel in moderately concentrated solutions when chilled. The reconversion of the chilled gels to free-flowing liquids is frequently achieved by a simple stirring process, but sometimes the addition of heat is also required. Sometimes the addition of a little water to the solvents can lower the temperature of gelation. Thus, the use of 90 per cent technical isopropyl alcohol and toluene can result in a more stable solution of the polyamide resin than when 99 per cent grades of isopropyl alcohol and toluene are used. However, some polyamide resins are extremely hydrophobic and require the use of completely water-free solvents.

Properties

Films of polyamide resins are unique in that they provide barriers to both moisture vapor and grease. Moisture vapor resistance may be increased even further by the addition of small quantities of paraffin waxes. In addition to showing a high degree of greaseproofness and resistance to moisture vapor transmission, polyamide resin films have reasonably good resistance to chemicals. Resistance to alkali is excellent, and resistance to most acids is very good. Outstanding resistance is shown toward mineral oils and vegetable oils.

An important property of polyamide resin films is heat sealability. Heat seals are formed at relatively low temperatures to a wide variety of surfaces, including glass, metal, glassine, waxed paper, coated cellophane and certain plastic films. The heat seal bonds retain their strength in the presence of grease, oil and moisture.

A number of polyamide resins have been developed that show "delayed-tack" properties. In this application, the adhesive polyamide film, after activation with heat, remains tacky for a long enough period after the film has cooled to room temperature to permit delayed heat sealing of the bond at some later operation and in the absence of heat.

A typical formulation of the delayed tack adhesive is as follows:

Polyamide-resin (Versamid 940)	414 parts by weight
Santicizer 9	131 parts by weight
Candelilla wax	24.5 parts by weight
Isopropyl alcohol	122 parts by weight
Toluene	122 parts by weight

Coatings with excellent slip and rub resistance can be made from the resins. In addition, the anti-blocking characteristics of polyamide resin films are quite good.

Polyamide resin films are extremely flexible, even without added plasticizer. The stability of these films to air and light is good. These films also have a very high gloss, which enhances their decorative properties.

If necessary, polyamide resins may be plasticized with materials such as the sulfonamide-type plasticizers (Santicizer 8) and by ester type plasticizers including tributyl phosphate and dibutyl phthalate. Dow resin 565 is a highly effective plasticizer. Modifying agents include rosin and rosin derivatives which tend to tackify the resin. Most phenolic and maleic resins are compatible, and solution compatability is also achieved with nitrocellulose. The various grades of polyamide resin differ largely in softening point and tack characteristics and may be combined to achieve virtually any softening point and degree of tack desired.

Polyamide resin solutions may be applied by various types of roller coaters or by rotogravure presses.

Polyamide resin-epoxy resin combinations

Polyamide resin-epoxy resin combinations are an entirely new type of high-gloss, thermosetting coatings now available to the paper converter. The polyamide resins used for this purpose have a relatively large number of amino groups spaced around the perimeter of the generally linear shape of the molecule. These primary and secondary amino groups react with the epoxy groups of expoxy resins to give much tighter cross linking than would be possible if only a few amino groups existed at the ends of the molecule.

The epoxy resin which may be used in combination with polyamide resin is a condensate of epichlorohydrin and bis-phenol. The polyamide-epoxy resins react to give an extremely hard, thermosetting coating which shows unique properties of resiliency and flexibility. Their solvent, alkali and acid resistance is excellent, and in general the combination has numerous properties of interest to the paper converter. Polyamide resin-epoxy resin combinations are applied as solvent solutions. Since they are highly reactive, the solvent solutions of the two resins must be mixed immediately before use. The speed of their reaction in a mixed solution is, of course, proportional to the concentration of the reactants and to the temperature. Thus, at 30 per cent solids, a mixed solution of the two resins could have a useful pot life of 3-4 days at room temperature.

Another important consideration in the polyamide-epoxy combination is the fact that no volatile co-product is formed during the reaction of the two resins. This is exceedingly important in lamination operations, since there is no danger of delamination due to the formation of steam or any other product after the volatile solvents have been removed.

Films of polyamide resin-epoxy resin combinations, when applied to paper, demonstrate unusually high gloss. The films are very clear and when properly formulated are practically colorless. Despite the fact that the films are very hard, they demonstrate excellent flexibility, which does not decrease appreciably on aging. The abrasion resistance of the films is excellent. Adhesion to a wide variety of surfaces including wood and cellophane is very good. The films have a high degree of stain-resistance and provide excellent barriers for alkali, dilute acids and numerous types of solvents. They are also effective barriers for water and water vapor.

These polyamide-epoxy combinations may be applied by conventional roller coating devices or by rotogravure presses. Despite the fact that curing depends on heat, drying is accomplished at relatively low temperatures. Blocking resistance of the film is good.

Simultaneous handling of logs, chips, hogged fuel and limerock

J. F. FRISCH
Pulp Division
British Columbia Forest Products Ltd.

Location of British Columbia Forest Products Ltd. sulfate mill on the southeast coast of Vancouver Island.

Woodroom, chip screening and conveying systems are designed to insure a maximum of automation in handling materials and a minimum in maintenance of equipment.

IN THE DESIGN of the bleached kraft mill for Crofton, British Columbia Forest Products Ltd. stresses that high-quality chips make high-quality pulp. The woodroom, chip screening and conveying systems have all been designed with this in mind.

It is also considered important that the systems must be as automatic and foolproof as possible; that they require a minimum of maintenance and clean-up; that maintenance and clean-up which is anticipated must be accomplished with ease. To reduce maintenance, the woodroom will be a steel structure with poured concrete walls, while the chip screen building is to be an all-concrete structure. The conveying systems have been designed for maximum flexibility and for future expansion.

Chip supply

It is the company's policy to utilize its forest resources in the most efficient manner possible. The wood supply for the mill comes from five major sources:

(1) Chips from the company's own sawmills.
(2) Chips from other sawmills.
(3) Logs from the company's limits.
(4) Logs from private operations and woodlots.
(5) Marginal logs from the company's sawmills.

Three major species of pulpwood —i.e., hemlock, firm and cedar—are used by the mill.

The scow dock

The scow dock, which parallels the shoreline, is faced with Larsen copper-bearing steel sheet piling tied back to a concrete anchor wall and rock mole. The area between the face of the scow dock and the shoreline has been filled with material cut from the millsite and by dredging. Part of the area behind the scow dock is used for storing limerock, and the remainder is utilized, when required, for chips and hogged fuel. The area surrounding the scow dock is being used for the woodroom, chip screen and hog building, roads and railway lines to the car ferry slip and shipping dock. The 400-unit scows are unloaded by a 6-ton double-cantilevered hammer-head Colby crane, which can travel the length of the 40-ft. scow dock. The crane is equipped with two buckets which can be rapidly interchanged. The 4¾-cu. yd. chip and hogged fuel grab is able to empty the scows at the rate of more than 60 units per hour, and the 1¾-cu. yd. limerock bucket is capable of unloading to storage at the rate of 150 to 160 tons per hour.

Within the structure of the crane there is a six-unit hopper and chain feeder, which conveys the chips or hogged fuel to a 36-in. belt conveyor, which runs the length of the dock.

At the head end of the scow dock conveyor is a two-way chute which discharges the hogged fuel, limerock or chips to one of two conveyors.

The woodroom

Although it will be used less and less as more chips are procured from outside sources, the woodroom will be the major source of supply in the first years of operation. In case of emergency it must also be able to produce all the chip requirements of the mill. Considering these factors, the woodroom has been designed to produce 80 units of chips per hour and is capable of handling logs from 9 to 60 in. in diameter and from 8 to 90 ft. long.

Logs from the log pond and booming ground are carried up the all-steel log haul to the woodroom. The log haul is driven by a drive consisting of a 125-hp motor, through a hydraulic coupling to a Pacific Western two-speed reducer. Smaller logs are brought up at 188 fpm and the larger at 108.

At the head end of the log haul the logs under 40 in. diameter are cut into lengths not exceeding 24 ft. by a 102-in. swing cut-off saw, while larger logs are cut by a chain saw with a 9-ft. bar.

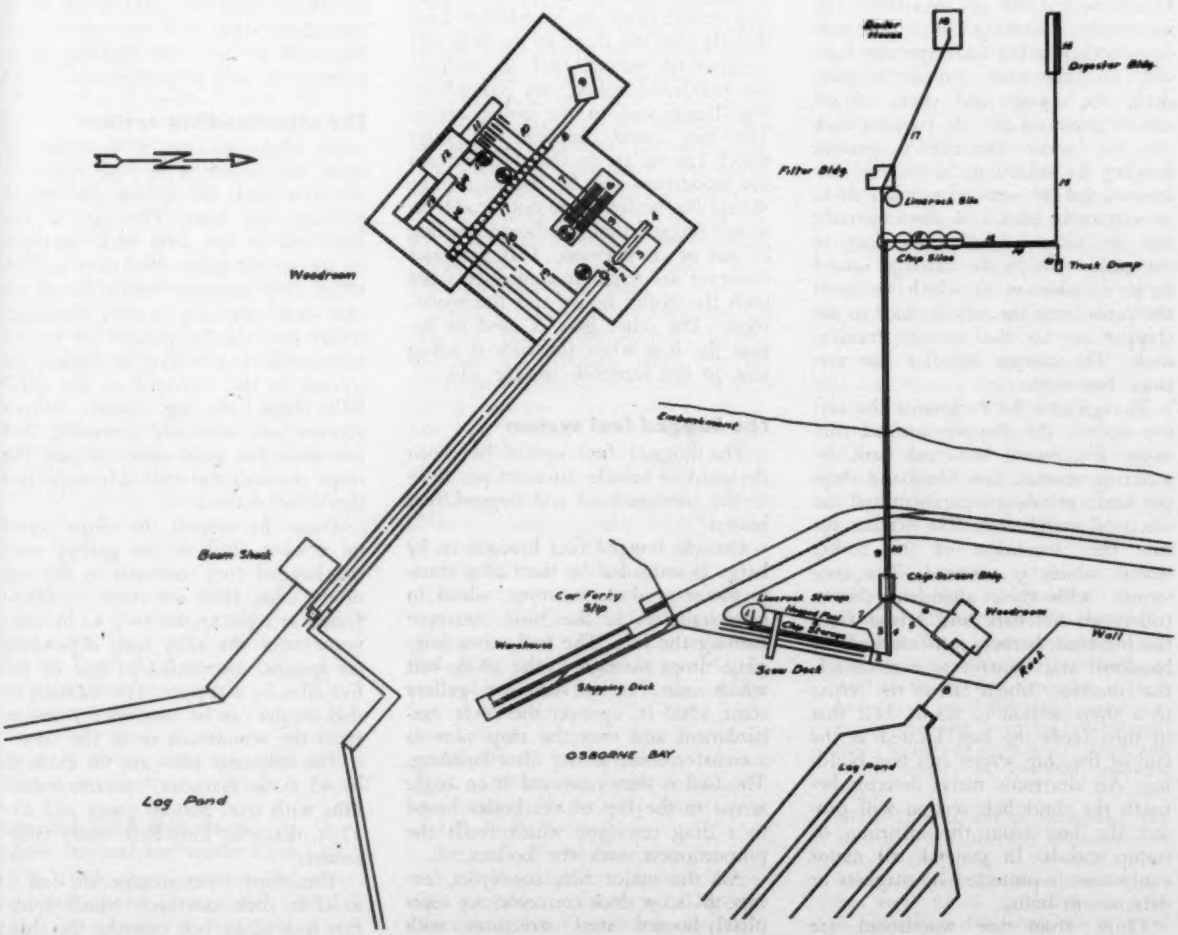
After the logs have been cut to length, they travel forward on a short 190-fpm conveyor, from which they are kicked to a transfer dock to the 60-in. Canadian Sumner Bellingham-type medium-package barker. After barking, the logs are loaded out of the barker to the barker outfeed transfer deck. From this deck, logs under 26 in. in diameter are loaded

Logs are debarked in a 60-in. Canadian Sumner Bellingham barker.

Logs are fed horizontally into an eight-knife Hansel chipper.

onto the 42-in. wide roll-case to a short chain conveyor which feeds the logs at 180 fpm into the spout of the eight-knife, 112-in. Hansel chipper. Logs to the chipper are fed in horizontally, and the knives are swept back, thus shearing rather than chopping the chips from the log. The chipper is driven by a direct-connected 1250-hp, 260-rpm synchronous motor with 275 per cent pull-out torque.

Logs larger than 26 in. in diameter are carried across the roll-case to a conventional West Coast-type breakdown mill. The logs are loaded by means of a Canadian Sumner log turner and skid lift to a Heaps 60-in.



Flow sheet of simultaneous log, chip, limerock, and hogged fuel handling systems.

opening, two-knee, heavy-duty, no-man carriage. The carriage will be driven by a Canadian General Electric carriage drive with amplidyne control. The carriage loading, cutting and unloading is all handled from the sawyer's pit beside the bandmill. Air and electricity to the carriage will be supplied through a pantograph.

The logs are cut up by a Sumner 9-ft. extended-column bandmill driven through V-belts by a 350-hp synchronous motor. The cants are offloaded by an automatic Michels offbearer to a bell and rollcase and hence through automatic jump skids to the offside transfer deck.

From the offside transfer deck the logs can either be fed to the roll-case to the chipper or loaded across the roll-case and outside runaround transfer and storage deck, from which they can be returned to the barker. This outside deck is used primarily for the handling of bundles of salvage and other logs which arrive by truck. The bundles are lifted up onto the deck by means of a Dominion 25-ton truck-mounted crane. The deck is used to return logs which have been split to facilitate cleaning out heartrot. The woodroom is set up for a four-man operation. The log haul operator handles the log haul, outside transfer deck, the swing and chain cut-off saws, the kickers and the transfer deck into the barker. The barker operator handles the infeed deck, loaders, unloaders and the outfeed transfer deck, as well as the barker. A third operator has the job of loading the logs to the chipper or to the carriage infeed deck, in addition to which he loads the cants from the offside deck to the chipper or to the outside transfer deck. The sawyer handles the carriage functions.

The ground floor contains the refuse system, the chipper outfeed conveyor, five Sweco 105-mesh bark dewatering screens, saw filing and chipper knife grinding equipment and the electrical switchroom. The screens ensure the cleanliness of the barker water, which is sewered. The conveyors, with their attendant chutes, collect all the bark and refuse from the log haul, barker, roll-case and the bandmill and transfer to a cross refuse conveyor, which carries the refuse to a short section of 48-in. belt that in turn feeds the hog located at the end of the chip screen and hog building. An electronic metal detector beneath the short belt section will protect the hog from the intrusion of tramp metals. In general, all major equipment is protected by magnets or detectors or both.

Chips from the woodroom are carried by two sections of 60-in. belt conveyor to a third 60-in. conveyor from the scow deck, which travels up and over the chip screen bin.

Chip screen and hog building

The equipment in the chip screen building consists of the 60-in. belt over the four 20-unit surge bins, four variable speed rotary vane screen feeders, four Orville-Simpson Rotex chip screens, an 18-in. oversize chip conveyor, a 36-in. disc Canadian Sumner rechipper, a cyclone, a hog chute, a Gruendler 6XD hammer hog driven by a 400-hp 900-rpm motor, a 42-in. accepted chip conveyor to the silos and a 30-in. hogged fuel conveyor from the hog.

Chips are plowed off the chip conveyor over the bin. From the bin the chips are metered through rotary vane feeders at the rate of 20 units per hour to the chip screens. The accepted chips pass directly to the accepted chip belt to the silos; fines go to the hogged fuel conveyor, and the oversize chips are carried to the rechipper and thence to the cyclone, located over the closest screen for rescreening.

Hogged fuel from the scow dock and refuse from the woodroom feed directly into the chute to the hog. All supplies of outside fuel, as well as the woodroom refuse, are hogged before being sent to the boiler house. The hog chute contains two gates which can be set so that refuse from the woodroom can be fed to storage should the boiler house not be able to accept hogged fuel, or should the hog be out of commission. This gate and conveyor are remotely controlled from both the boiler house and the woodroom. The other gate is used to bypass the hog when limerock is being sent to the limerock storage silo.

The hogged fuel system

The hogged fuel system has been designed to handle 30 units per hour to the combined oil and hogged fuel boilers.

Outside hogged fuel brought in by barge is unloaded by the Colby crane to the scow dock conveyor, which in turn transfers to the 36-in conveyor feeding the hog. The fuel, after hogging, drops through to the 30-in. belt which runs in a conveyor gallery some 1500 ft. up over the 70-ft. embankment and over the chip silos to a transfer chute at the filter building. The fuel is then conveyed at an angle across to the top of the boiler house to a drag conveyor which feeds the proportioners over the boilers.

All the major belt conveyors, except the scow dock conveyor, are completely-housed steel structures with corrugated aluminum siding and curved aluminum roofs. The galleries are completely floored with T. & G. flooring. The conveyor stringers are hung from the top for ease in clean-up and maintenance. Trusses form the side walls of the galleries, which vary in width to accommodate either one or two conveyors and a walkway. The truss sections span about 100 ft. between bents.

The limerock system

Beneath the limerock pile is a tunnel and an 18-in. belt conveyor. Limerock is metered onto this conveyor at the rate of 100 tons per hour by means of gates in the tunnel roof. This conveyor discharges the rock onto the scow dock conveyor, which in turn, transfers it to the hogged fuel conveyor which bypasses the hog when used for this purpose, delivering the rock to a chute at the filter building. This chute contains a two-way gate set to discharge to the limerock silo beside the filter building. To ensure that the limerock arrives at its proper destination, the conveyor under the limerock storage pile is electrically interlocked so that it may not be started until the gates at the head end of the scow dock conveyor, at the hog and at the filter building have been set in their proper positions.

The chip-handling system

All chips arriving at the mill by scow are unloaded by the crane to the scow dock conveyor at the rate of 60 units per hour. The gate at the head end of the scow dock conveyor is set to discharge the chip to the 60-in. chip conveyor which travels up and over the chip screen building, where they can be plowed off to the screens for re-screening or bypass the screens to the conveyor to the silos. All chips arriving from outside sources are normally screened, but provision has been made to pass the chips through the mill screening system if so desired.

From the screens the chips travel on a 42-in. belt in the gallery with the hogged fuel conveyor to the top of the silos. Here the chips are transferred at right angles to a 42-in. conveyor over the silos and, depending on species, distributed to one of the five silos by a tripper. The location of this tripper can be controlled remotely from the woodroom or at the silos.

The 400-unit silos are 90 ft. high by 45 ft. in diameter, concrete monoliths with steel bottom cones and five 17-ft. diameter Link-Belt rotary table-feeders.

The chips from storage are fed to a 42-in. belt conveyor which transfers to a 42-in. belt carrying the chips

(Continued on page 39)

How lining with Inconel combats digester corrosion

J. F. NATION and J. M. TULL*

This digester body was fabricated from 10% Inconel-clad steel for Crossett Paper Mills.

▶ Inconel layer assures corrosion resistance, while steel backing provides structural strength at economical initial cost.

THE DRASTIC INCREASE in the corrosion rate for pulp digesters made of carbon steel has been the cause of wide concern throughout the paper industry during the last 10-15 years. One solution to the problem, however, has now been found in a number of sulfate pulping mills. During the last five years, 16 new digesters fabricated of steel clad with Inconel nickel-chromium alloy have gone into operation. In every case, these mills show either no corrosion or a corrosion rate very much lower than that of carbon steel and alloy steels in the same mill.

The reasons for the accelerated corrosion of steel alkaline pulp digesters have not been definitely determined. In all likelihood, a number of factors have contributed. It may be due to variations in cooking liquor composition caused by process changes in chemical recovery operations. Possibly the increased corrosion results simply from increased production per vessel or from higher operating pressures and temperatures.

Whatever the reason, the seriousness of the corrosion problem brought about determined efforts to find a satisfactory solution.

Inconel-clad digesters show lowest corrosion rate

In 1940, the Corrosion Engineering Section of International Nickel Co., Inc. began a continuing research program on digester corrosion in cooperation with several mills. Test spools of various chromium steels, chromium-nickel steels and other alloys were inserted in operating digesters of sulfite, sulfate and soda process pulping mills. Specimen steel and alloy test plates were welded to various sections of digesters and left in place for periods ranging from months to years. Close and constant checks were kept on corrosion rates.

Even in these early experiments, one of the alloys tested showed outstanding promise. This was Inconel nickel-chromium alloy, which has a nominal composition of 77 per cent nickel, 15 per cent chromium and 7 per cent iron. Inconel alloy had been included because of its known high resistance to corrosion by caustic alkalis and because its coefficient of thermal expansion is close to that of carbon steel.

Trial results were so promising that even in the initial stages of the program many pulp mill men believed Inconel would prove to be the solution to their alkaline pulping problems. Later, in large scale tests, domes, courses and entire digesters were protected by Inconel alloy. Subsequent tests conducted by independent authorities confirmed these findings.

Because of the increasing acuteness of the alkaline digester corrosion problem, the Tappi Digester Corrosion Sub-Committee in 1950 began an industry-wide study of the problem. During the course of the investigation, 53,000 wall thickness measurements utilizing modern non-destructive measuring techniques were collected and analyzed. Involved in the study were 97 digesters in 14 mills.

Thirteen of the digesters utilized alloys, six of these being Inconel alloy. In one mill the average corrosion rate for Inconel alloy was found to be 7 mils/year, while carbon steel showed an average rate of 30 mils/year. In another mill these ratios were 1 mil and 51 mils/year, respectively. The median corrosion rate of the six Inconel vessels was found to be 4 mils/year, lowest of all alloys used.

The reasons for the superior protection afforded by Inconel alloy are to be found in the basic properties of this material. These are:

1. Superior corrosion-resistance. Inconel alloy has high resistance to the attacks of alkaline cooking liquors.
2. Freedom from stress corrosion cracking. In continued use in kraft mills, as well as in the first extensive tests, it has shown itself free from stress corrosion cracking, even by concentrated white liquors or mixtures of black and white liquors at elevated temperatures.
3. Similar coefficients of expansion. The coefficient of thermal expansion of Inconel alloy, 6.4×10^{-6} in./in., corresponds very closely to that of carbon steel, 6.7×10^{-6} in./in. at 150° F, minimizing difficulties due to varia-

(Continued on page 36)

*Metal & Supply Co. Inc.

Deceiving maintenance records

B. A. MARGO
Consulting Management Engineer

Maintenance overhead in paper mills is a large expense and should be included in the maintenance budget as well as on history cards. This will frequently show an economic advantage in an earlier replacement of worn-out equipment.

AT A TIME when maintenance in paper mills receives increasing attention and recognition as a vital function, it would seem helpful to explain the need for more reliable maintenance records. The decisions based on such records (also called history cards) have a profound effect upon maintenance expenses as well as operating efficiency. Therefore, the information entered on them should be reliable and complete. However, it is fair to assume that, quite generally speaking, the total maintenance cost shown on such cards is about 50 per cent too low, an amount which is not negligible. Where this discrepancy comes from and how it may be eliminated will be explained in this article.

Why is maintenance overhead neglected?

As a rule, history cards show maintenance labor and material cost but not the overhead applicable to these two cost factors. This overhead may represent another 50 per cent of the cost, as can be shown quite easily. If a pump is repaired by the machine shop of a paper mill, the total of labor and material posted on the corresponding history card may amount to $400. If the same job is done by an outside machine shop, the entry will read about $600. The difference of $200, or 50 per cent of $400 is explained by the overhead plus profit which the outside machine shop adds to its labor and material cost. The machine shop of the paper mill has probably a higher overhead because it is not operated to show a profit. Therefore, we are safe in talking about a difference of 50 per cent appearing on the history card.

This difference is neglected because recording of maintenance cost on history cards is a relatively recent development. The maintenance office took over what the crafts foremen did on their own volition. This was a great step forward and it took courage on the part of management to permit this kind of clerical work and additional overhead. On the other hand, the overhead of the machine shop disappears in the overhead of the mill anyway. Consequently, there was no need to post it on history cards.

The same reasoning was applied to the other shops. In addition, there exists an understandable fear to add more clerical work to this phase of the business. Finally, personnel qualified to set up the proper procedure became available only during the last few years.

Why should maintenance overhead be posted?

After establishing the amounts to be posted (a procedure which will be explained later on), the time required for posting itself is of no consequence, particularly where an efficient posting method does exist, whether it is hand or machine (punched cards) posting or not. In any case, even if additional expense should be involved, it seems to be advisable to consider posting of maintenance overhead because an essential function of history cards is to bring to light when maintenance costs become excessive. Without posted maintenance overhead, this point is reached much too late. Consequently, machines and other pieces of equipment are kept in operation much longer than advisable, not only from the viewpoint of maintenance cost, but also from the viewpoint of operating efficiency. As soon as it becomes feasible to show that earlier replacements are economical as far as maintenance costs are concerned, we can also expect to have fewer breakdowns and losses of production because the mill will change to more modern equipment sooner.

In this connection it is important to keep in mind that the big profit figure shown at the end of the fiscal year is ordinarily the result of hundred thousands of relatively small actions which had to be performed conscientiously, intelligently, in time and based on reliable data. Decisions regarding replacements because of excessive maintenance cost belong into this category too.

Another reason why maintenance overhead should be posted is the following. The decisions mentioned depend frequently upon the maintenance expense for the piece of equipment in question relative to its book value or the replacement value. If the expense posted is too small, such decisions cannot be made with the desirable degree of reliability. In other words, if history cards are kept at all, it seems to be good business to show on them the complete picture of maintenance expense.

What is maintenance overhead?

Maintenance overhead are dollars spent for maintenance which differ from the dollars spent for maintenance labor and material only in

one respect: they either cannot be charged directly to the work done or it would be too cumbersome and expensive. Take for instance the salary of a crafts foreman. Theoretically, we may ask him to keep a daily record of the hours he spends on each job done by his crew. These hours could be evaluated with the hourly rate of his earnings, and these dollar values could be posted on the different history cards in question. Thus his earnings would become directly chargeable with the exception of the time he spends on clerical work. The latter would be mostly indirectly chargeable anyway. Still, even to make the former directly chargeable is normally not practical.

In the case of the crafts foremen we have a theoretical choice. However, there exist numerous expenses where we have no choice. Take the salaries of the maintenance superintendents and their assistants; the salaries of the master mechanic and the plant engineer and his staff (designers, clerks in the maintenance office); the wages of the clerks in charge of the tool room and of spare parts; the cost of perishable tools; light, heat and power; maintenance (and perhaps rent) of the different shops (machine shop, carpenter shop etc.); maintenance and depreciation of machines, tools and instruments used for maintenance purposes; insurance etc. as listed on Table No. 1.

In addition, we have to consider the value of the time spent by the plant manager, the purchasing department, the payroll and the accounting department on maintenance work. Normally, we have no record of their time. Therefore, we have to be content with an intelligent assumption. In this respect we are faced with the same cost accounting problems facing the outside machine shop mentioned or the manufacturer of machines and equipment from whom the paper mills have to buy expensive spare parts. If these suppliers are properly organized they use a cost accounting system with departmental overhead distribution which gives them a reasonably accurate picture of their total cost. Maintenance in paper mills runs into six and seven figures per year. If we want to handle these expenses intelligently, we too have to know them completely. The total, including maintenance overhead, belongs in the maintenance budget, and the subtotals including overhead belong on the history cards.

Table I

Overhead Collection

Overhead Items		Total	Machine Shop	Departments as listed below	
a- Material,					Welding Shop
cleaning & lubricating					Carpenter Shop
electrical					Tin Shop
small repair					Pipe Shop
stationery and supplies					Pattern Shop
tools, perishable					Salvage Shop
welding rods etc.					Tool Room
b. Labor,					Riggers
cleaning & lubricating					Spares Storage
clerical					Millwrights
holidays, vacation					Laborers
small repairs & maint.					Painters
supervision					Masons
transportation etc.					Electricians
c- Monthly Charges,					Optional for
gas					Machine Shop:
light					Engine lathes
outside repairs					Milling machines
power					Planers
steam					Radials
telephone, telegraph					Boring mills
traveling expense, etc.					etc.
d- Yearly Charges					
depreciation					
insurance					
large repairs, prorated					
taxes					
Total own Overhead	$				
Management	$				
Accounting Dept.	$				
Personnel Dept.	$				
Payroll Dept.	$				
Purchasing Dept.	$				
Tool room	$				
Spares storage	$				
Total Overhead	$				
Labor cost	$				
Total O.H. & Labor	$				
Labor	hrs.				
Labor	$/hr.				

How to collect maintenance overhead

Table I shows how maintenance overhead may be collected monthly. The necessary data are available partly in the accounting and partly in the maintenance department. The compilation of the data may be handled by a cost accountant. This table ends in hourly rates per trade including overhead. Thus, the posting on history cards does not cause any additional work. An alternative is to establish overhead percentages per trade which would have to be applied to the total labor cost as posted on history cards per accounting period. The latter method, however, causes more work in posting.

The machine shop may have to be broken down into several departments as shown because the overhead in these departments differs too much to permit the use of an average (see Table II).

Table II

Departmental Overhead Percentages

Department	Overhead Percentage
Engine lathes	150
Milling machines	250
Planers	125
Radials	175
Boring Mills	175
Hand work	100

Note: the percentage figures shown above are not to be used in actual applications but are only intended to indicate the great variations which normally may be expected.

Such percentage figures are applicable to labor, e.g. if a lathe operator earns $2 per hour, the overhead applicable to his work is $3 per hour,

which brings the total of labor plus overhead to $5 per hour.

Distribution of tool room and spares storage

The total own overhead of the tool room may be distributed over the other departments according to the estimated time the attendant spends on them. The total own overhead of the spares storage may be distributed similarly. This is a short cut. Actually, this overhead should be applied to the value of spare parts used in form of a special percentage figure. However, since this figure should normally be very small, this short cut may not result in differences of any importance.

Overhead applicable to the different trades

It stands to reason that the overhead amounts applicable to the different trades vary from mill to mill and also in a specific mill. Consequently, only approximate figures can be given to indicate the spread that may be expected. The lowest overhead percentage applies possibly to laborers, amounting perhaps to 75 per cent; the highest one possibly to welding, which should be about 350 per cent. This great spread explains why the use of an average overhead percentage of perhaps 200 per cent or of an average hourly rate for all trades would be misleading. Such averages would be permissible only if all trades participated on all maintenance work to approximately the same extent which, obviously, is not the case.

Overhead collection for budget control

The overhead collection sheets may be used for an easy and effective control of the maintenance budget. One copy each (which may be prepared monthly) may be cut into strips per departments. These strips may be pasted on a summary sheet per department thus:

Department Machine Shop

Overhead Items	January	February	March etc.	Yearly Total
a- Material, etc. as shown on Table I				

This summary sheet would show at a glance any fluctuation of costs from month to month or whatever the accounting period is. This form of control has shown its value in manufacturing companies with departmental overhead distribution and may be equally useful for control of maintenance overhead.

Conclusion

Maintenance overhead in paper mills is a large expense which should be considered in the maintenance budget as well as on history cards. Posting of maintenance overhead on history cards would produce a complete and more reliable picture of maintenance costs per unit to be maintained. Accordingly, decisions regarding continued repairs or replacement because of excessive maintenance costs would be put on a sounder basis. The net result should be lower maintenance costs and better production.

Inconel-clad digesters

(Continued from page 33)

tions of temperature in the digester heating and cooling cycle.

Sulfate digesters already in service have been successfully protected by Inconel lining.

Three techniques of Inconel lining

Inconel cladding and lining for the fabrications of new digesters is now being made by three major producers. Their fabrication methods differ, but each provides the economical structural strength of steel combined with the corrosion-resistance of Inconel alloy.

Lukens Inconel-clad steel is a composite plate formed by integrally bonding corrosion-resisting Inconel alloy to a heavier steel backing plate. A hot rolling process is used, and the metallurgical bond thus formed is stronger than the backing steel itself. The Inconel cladding is usually 10-20 per cent of the total thicknesses.

Hortonclad steel, made by Chicago Bridge & Iron Co., is a bimetallic plate formed by fusing a corrosion-resistant layer to a heavier steel backing plate. The Inconel alloy is integrally and continuously bonded to the steel by a special high-vacuum process under close metallurgical control, using a copper alloy intermediate layer. This method of cladding combines a continuous high-strength bond with a guaranteed uniformity of thickness of the Inconel layer itself.

Smithlining, produced by A. O. Smith Corp., is a closely controlled resistance spot welding process which inseparably bonds the alloy lining to a carbon steel backing. This is done by an automatic welding machine before the plate is formed. The metallurgical properties of Inconel are well suited for resistance welding. These properties, along with its corrosion-resistance, suggested the use of Inconel alloy in the Smithlining process for digesters.

Some remarkable results

Some of the installations of Inconel clad digesters have produced truly remarkable results. At Crossett Paper Mills Crossett, Ark., there are some steel digesters which experience an average corrosion rate of 62 mils per year. Five years ago one was replaced with an Inconel-clad steel digester. After five years of use there was no measurable decrease in its wall thickness.

This is not an isolated case. Other mills in the South and in the Pacific Northwest have reported outstanding service records of Inconel digesters. Crown Zellerbach Corp., Port Townsend, Wash., is now completing its program of installing eleven Inconel-clad digesters to replace its mild steel vessels. The kraft (sulfate) chemical process used here employs a mixture of caustic soda and sodium sulfide. Cooking time is about 2 to 2½ hrs. Conversion to Inconel-clad digesters started in 1951, after experimentation with several corrosion-resisting alloys.

Among the other Inconel-lined digesters already in service are five digesters clad with 20 per cent Inconel alloy at Union Bag-Camp Corp. in Savannah, Ga., and three digesters with the top third clad with Inconel alloy at Gulf States Paper Corp., Tuscaloosa, Ala.

In addition to the installation of new all-Inconel-clad vessels, many other digesters of carbon steel or originally lined with other alloys have now been relined with Inconel alloy to take advantage of its superior resistance to corrosive attack.

New soil builder developed from bark

The plant at the left is the control, the second from the left has received a commercial soil conditioner, the two at the right received the new bark soil builder.

A NEW SOIL BUILDER has been developed that opens up a vast potential market for bark—the normal waste material of the lumber, pulp and paper industries.

Scientists at Armour Research Foundation of Illinois Institute of Technology report that they have developed a method to convert bark into an inexpensive and unusually effective soil builder.

In tests conducted with greenhouse plants and field crops, the product was found to be more effective in promoting growth and improving the soil than either peat moss or a commercial soil conditioner.

Dr. C. Roland McCully, scientific adviser in the Foundation's chemistry and chemical engineering research department, said the bark soil builder, in conjunction with fertilizer, turns clay and sand into rich loamy soil in which plants grow at a surprising rate.

Dr. McCully said the soil builder accomplishes these three things:

1. Loosens the soil and improves its moisture holding capacity.
2. Serves as a base for fertilizer.
3. Controls the rate at which the plants obtain their food from the soil.

It is the latter characteristic of the bark soil builder that makes it most valuable, according to Dr. McCully.

Ion exchange in soil fertility

The fertility of soil it dependent upon a proper supply of nutrients continuously available to the plants. Thus, it is desirable that a mechanism be available in the soil for storage of plant nutrients.

One of the methods by which large amounts of these nutrients can be held in the soil without harm to plants is the ion exchange mechanism involving microbiological activity in the soil.

Susceptibility of the material to microbiological decay can be controlled in the bark soil builder by the degree of condensation in the processing which, in turn, regulates the rates of release of nutrients to the plants.

The production of the soil builder involves the grinding of the bark and the condensation of the tannin by the addition of formaldehyde, followed by acidification with hydrochloric or sulfuric acid.

The mixture then is heated for a brief period to complete the condensation process. Water and other excess chemicals are removed and the material is washed and dried.

The average lifetime of the soil builder in the soil is about five years. This life span can be varied by increasing or decreasing the condensation or the ion exchange rate.

Experiments with the soil builder have not yet determined the optimum ion exchange capacity for most soils. Different soils and plants may require different ion exchange capacities.

Plant nutrients can be added to the soil builder to make one operation out of the task of working a soil builder and fertilizer into the ground.

Test results

The bark soil builder was tested in the field by the University of British Columbia with barley and beets. The results, which were described as excellent, confirmed indoor tests at the Foundation.

In sand, the product gave 46 per cent more growth than fertilized controls, 92 per cent more growth than peat moss additions and 134 per cent more growth than sand with synthetic exchange resins added.

In clay, the same product gave 120 per cent more growth than the fertilized controls and 28 per cent more growth than additions of a popular soil conditioner.

Aside from the plant growth tests, the bark products were observed to increase the moisture-holding capacity of the clay soils and to give them a porous granular structure so that acceptance of moisture was more rapid.

Each year tens of millions of tons of bark are made available by lumbering firms, pulp and paper companies. Some of this material is partially dried and used as a fuel, but most of it is disposed of, very often at a considerable cost.

It is quite possible that this development will enable even those companies that do not contemplate production of soil builder material to dispose of their bark wastes at a profit.

Despite these advantages, the soil builder is not yet a finished product. More research is needed to select the most effective type of product and processing methods.

For example, one type of soil builder that has proved particularly effective in the latter stages of plant growth has exhibited a tendency to repress germination. Another type that does not repress germination was less effective in the later stages of plant growth.

Pulp washing — a panel discussion

Moderator: Harry E. Weston, American Pulp & Paper Mill Superintendents Association

Panel Members: C. K. Textor, Bauer Bros. Co.; H. K. Waters, Swenson Evaporator Co.; Ward Pitkin, Dorr-Oliver Inc. (substituting for Thomas B. Calhoun of Dorr-Oliver); Bruce Armstrong, Appleton, Wis.; C. W. Converse, Sprout, Waldron & Co. Inc., and Edwin Kemp, Bauer Bros.

THE FOLLOWING is a transcript of the discussion of pulp washing held on December 4, 1956, as part of the Fifth Annual Pulp and Paper Conference at the University of Florida, Gainesville, Fla. For purposes of better continuity the questions and answers have been regrouped, insofar as possible, under definite subject headings.

Control system used in pulp washing

Q. (Ward Pitkin, Dorr-Oliver Inc.) I would like to ask Mr. Waters a question regarding the curves which are shown in Fig. 6, the last page of the little brochure that he gave us. In the lower right hand corner there is a curve, dilution factor against total sodium sulfate loss, on jack pine. How was the sodium sulfate loss determined?

A. (H. K. Waters, Swenson Evaporator Co.) That determination was a measurement of total salt cake by the zinc uranyl acetate method. I might mention that, at first, the standards were set up to correlate zinc uranyl acetate measurements with conductivity so that, by measuring the conductivity of the liquor, it could be related back to toal salt cake, which was determined on a standard basis by the TAPPI Standard using zinc uranyl acetate.

Q. (Mr. Pitkin) How do you explain the fact that you get such a low salt cake loss with such a low dilution factor on jack pine? Looking at southern pine, the situation is completely different.

A. (Mr. Waters) Well, one of the things that I think will explain it is the difference in the TAPPI permanganate number. First of all, the jack pine cook is a softer cook and somewhat easier to wash. Add to this the fact that this happens to be one of our finest installations. A considerable amount of work has been done on it to bring it up to the standard we believe can be achieved with any pulp washing system. There is no doubt in our mind that, if the same procedures were followed in the southern pine system, the performance could be materially improved. We realize that it is difficult to obtain a direct correlation between jack pine and southern pine. In fact, our opinion is that jackpine, all other conditions being equal, is somewhat more difficult to wash than southern pine. It is a more resinous wood. However, one should consider the work that was done on this system. All of that work is available in a paper, "Sulfate Pulp Washing At Thilmany", that was presented at the Houston meeting of the Alkaline Pulping Conference in 1953.

Q. (Roy E. Peach, Rayonier Inc.) I would like to ask a question of Mr. Waters. From the values given in your paper, I gathered that there may be some differences in techniques in the way soda and salt cake losses are determined. I wonder if you could go through your technique and give us a little more background as to just how you sample and your techniques for running those determinations.

A. (Mr. Waters) First of all, there are two things we want to consider. One is the analyses for salt cake. I cannot recite that in detail, but Bill Dedert has a copy of the TAPPI Standard. If you wish to look at that, it is available. The other thing is the method of taking the samples. One procedure that is used consists of taking foot-square samples across the face of the washer drum. Knowing the rate of drum speed, it is possible then, by over-drying that sample, to calculate rather closely the tonnage rate you are handling across the washer and also to determine the bone-dry consistency. That then picks up the figures that you need to determine the performance of the equipment as concerns tonnage and consistency. Knowing the amount of water applied to the last-stage showers, you can determine the water rate to the washers. Then, the pulp sample is analyzed for salt cake in accordance with TAPPI Standard, which gives you the other value that you need — your total salt cake loss. By applying these figures in the dilution factor formula you can determine the dilution factor as it relates to total salt cake. Bill may have something to add to that but, in general, that is the procedure that is used.

A. (William G. Dedert, Swenson Evaporator Co.) Yes, I would like to add to it. To begin with, we are not advocating any particular methods to measure chemical losses. The thing that we believe necessary is that, if you are going to compare results — let us say your mill against another mill — you will need to make sure that the measurements in both cases are on the same basis. If you measure total salt cake, make sure that the next fellow is measuring total salt cake. If, in your mill, you carry out your day-to-day control according to a conductivity test, which does not take into account the bound soda previously referred to, then you just have to make sure that the comparison data are obtained the same way. Day-to-day may not be all-important. It's mainly important when you compare results, or when you use the chemical loss and the dilution curve to arrive at the economic balance between pulp washer operating conditions as against the steam costs to evaporate liquor. These are the things we are interested in.

Q. (G. W. Hough, Waldorf Paper Products Co.) Along this line of soda loss, just how many mills actually use the conductivity measurement on the filtrate on the last washer to control the washing? I think I know of one place where they actually use the conductivity to give them a control. Ordinarily, the foreman just comes along, grabs a sample, squeezes it out into his palm, and if it is clean looking, it is a good wash. Then, the chemists come along and check for soda loss once a day — and that is your control. Mr. Waters did mention the relationship between conductivity and salt cake loss. I

was wondering just how many people actually use that conductivity as a control?

A. (Shealy, St. Joe Paper Co.) I will say that, in the past, we have used it; but we don't have it installed now. Before our expansion, we used conductivity on the third stage filtrate to correlate total loss in the third stage. I will say that it works very well. If you run a number of tests on the third stage in any one system it seems to work. This is because your consistency on the third stage for any one system and for any one production rate will more or less remain within certain limits. Of course, if the consistency of the third stage varies considerably, you probably would not get very good correlation. However, we did at that time get very good correlation between the conductivity of third-stage filtrate and the soda loss in the third-stage sheet.

Q. (J. J. Owen, Jr., Union Bag-Camp Paper Corp.) I want to ask Mr. Shealy, if conductivity worked on their washers, why was it discontinued?

A. (Mr. Shealy) The only answer I can give to that is, I don't know. You may know we installed screw presses but removed them and put in valveless washers. We had a considerable problem with the valveless washers because of consistency variations, etc. We just had our problems, just like all of you have problems. We had this one conductivity instrument, a recording unit. Why it was not hooked up in the new installation, I don't know.

Q. (Mr. Owen) I would like to ask Mr. Pitkin or Mr. Waters: What methods are now being used to provide washer operators with immediate answers on the performance of their washers? What conductivity, or other types of tests are now being used, either for manual or automatic control?

Q. (Mr. Pitkin) Do you mean a quick mill method that the operator can use in the wash room? Conductivity is used in some mills. They squeeze the liquor from the sheet from the final washer into a beaker. They then introduce two electodes connected to a meter and read the result. That is one method that is used. Some washing installations are controlled by the Baumé of the liquor being returned to the evaporator. They have a continuous Baumé recorder, and they watch that. If it goes up, they usually know that perhaps they are washing a little dirtier; and, if it goes down, they know that they are using a little too much water. Therefore, they get their control that way. Another method consists of taking a handful of the sheet from the final washer and squeezing it to get the color of the liquor. That is done on a good many installations. The efficiency of the washing system is much better if it can run uniformly without particular variations. Therefore, good instrumentation and control in the system is highly important. If that is done, you get pretty good washing, and you don't have too much to worry about in your ups and downs of salt cake in the final sheet.

A. (Mr. Waters) I would like to express the same points that Ward made only in the reverse order. I would say that most mills these days control by picking up a handful of pulp and squeezing it. If it looks good, the washing is good. This is daily routine control. I think in about a third of the mills either of two other methods is used. These are either a check on the Baumé of the liquor to the evaporator or conductivity control. Also, I think in some cases the washroom waits until they get a complaint from the paper mill.

A. (Mr. Dedert) A point about this control. There has just been a report published by a gentleman from S. D. Warren Co. at Cumberland Mills, Maine. It is not our equipment, but it concerns vacuum washers. The author described in the paper the details of a completely controlled pulp washer system using a conductivity recorder controller on squeezings from the third-stage filtrate. He uses that to reset the wash water on the third drum and also, by ratios, resets the showers on the first and second drums. So, that is being done. I know nothing else about it except what I have read in this particular paper. I would also like to re-ask the question to Mr. Armstrong about recommending consistency to carry out this retention time. I might as well ask about screw presses as well as vacuum washers.

A. (Mr. Armstrong) Practically all the data we have submitted here refer to press washing because that was the job I formerly had for a considerable number of years. We were establishing data and trying to answer questions that arose. The method we used in testing this was to take a sample at 40 per cent consistency. Then we added sufficient black liquor of known strength to the pulp to bring it to the entering consistency we were using, 4 per cent. We gave that time, then, to come to equilibrium and each minute after that took a sample and measured the Baumé of it, holding the sample in a temperature bath.

Simultaneous handling

(Continued from page 32)

over the top of the machine shop and stores to the digester building. A 48-in. conveyor and tripper above the digester operating floor charge the digesters through a specially designed funnel in less than 25 minutes. The conveyor to the digester building contains a Merrick Weightometer and a metal detector to protect the digesters. The complete conveying system, including the feeders and the tripper, is controlled from the digester operating floor.

The chip-handling system to the silos has been designed so that in the future the system will be able to handle two species of chips at the same time from two different sources by merely installing an additional conveyor above the initial in the galleries. Space has also been provided for a second conveyor and tripper over the initial silos and for five additional silos. Provision for expansion has been made in the system between the silos and the digester building for a second handling system in the galleries.

Screened chips arriving at the mill by truck in 10- or 13-unit trailer trucks are loaded into a 13-unit hopper in the ground. A steel frame work carrying a crane, lifts up the front end of the trailers and dumps their loads into the bin. A chain conveyor in the bottom of the bin conveys the chips up an incline to a 30-in. belt conveyor travelling some 250 ft. up and over three of the chip silos. Plows on the belt shear the chips to the appropriate silo, depending on species. The plows, as well as the conveying system, are controlled at a station beside the dump. The truck-unloading system is able to handle chips at more than 60 units per hour to ensure that the truck turnaround time is kept to a minimum. In the eventuality that some chips arrive by boxcar, a railway spur is provided for over one end of the truck dump. It is possible to unload the boxcars into the same bin.

The chip-handling system has been designed for complete versatility. Only in this way can efficiency be ensured in future operations.

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1. *Low first cost.* The Bird Save-all is a self-contained unit. No auxiliary equipment needed. Simple gravity is the separating force.

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Estimates of net savings can be worked out for you before you make the investment in recovery equipment. Let us show you how substantial they might be.

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CURRENT COMMENTS

Condition temporary . . . the blue's not fading . . . and no collusion

The nation's paper companies have earmarked $900,000,000 for expansion in 1957, a hundred million dollars more than even the previous high record building year of 1956. At the same time consumption of paper, especially in the printing paper field, has been easing off in the first two months of the year. The industry leaders, however, are not discouraged, saying that the condition is temporary, and that every indication is that a pick-up will make up for the lost tonnage not being consumed.

The growing demand for paper encourages the manufacturers to believe that the "profitless prosperity" evident in many other industries is not likely to have a serious impact on the papermakers.

It is admitted that costs of production, materials and labor are not being compensated by higher prices for the product, even though there have been some increases. Larger sales totals are not being equalized by a proportionate increase in profits. There has not so far been any trend toward reduction of dividends, which are being paid at a rate that holds paper mill securities in the blue chip class. As yet there is no indication that the tint of the blue is fading.

Small industries suffer

Labor, on the other hand, is steadily gaining income through strikes and new contracts. Printing and publishing earnings have come down to 3.9 per cent, as compared with 5.5 per cent a year ago. The small industries are suffering most, while such huge industries as paper have such a backlog of consuming necessity that the effect of wage and other costs is minimized.

An effort in Congress to find ground to act against the increase in newsprint prices has come to nothing. Hearings have brought the statement from a high official of the Department of Commerce that there is no evidence of collusion in the across-the-board price increases. He agreed with a Congressional inquisitor that the United States consumers are at the mercy of the Canadian producers as far as prices are concerned.

*Current Comments are contributed, and the opinions expressed do not necessarily reflect the views of the publisher.

Under different conditions

Crown Zellerbach Corp. is preparing to resist to the utmost the order of the Federal Trade Commission to divest itself of St. Helens Pulp & Paper, which it acquired in 1953. At the instance of an FTC examiner, Crown Zellerbach is given six months to divest itself in good faith of all assets of the St. Helens company. It is forbidden to cut for its own use any of the St. Helens extensive forest lands. The Crown company says it had carefully studied all the possible legal complications before entering into the $10,000,000 deal and will leave no stone unturned to prevent the FTC order becoming effective. The merger of the two big paper mills was under different conditions than those that led to the recent failure of the Federal Trade Commission to prevent the acquisition of a great lumber company by International Paper. In the latter case no present production of paper was involved on the part of the lumber company, whose stumpage was being acquired as a reserve for future paper mill construction.

Flexible tariff proposed

The American Tariff League is spear-heading a move on the part of many domestic industries which fear the effects of the continuing wave of tariff rate reductions. The League's program asks the formation of an American Producers Council of manufacturers to advise the government on tariff matters. One proposal is for flexible tariffs to vary as wage conditions abroad justify action to protect American labor. The league by indirection complains of the Administration's tendency to subordinate domestic production to the end of improving the economic standard of foreign countries.

Congress will soon receive a bill to revamp the Anti-Dumping Act on the basis of recommendations by the Bureau of Customs. The recommendation advises against any changes in the provisions of the present law for a tighter definition of "injury" to domestic industry, as well as opposing any change in the present definition of "industry." Whether an "industry" is an entire group of mills or a single or regional part of the entire industry is left for later determination by the courts or Bureau of Customs. The Bureau, however, recommends relaxing the conditions under which foreign prices are used as the basis of determining sales as dumping prices. Heretofore the freely offered home price or cost of production was the sole basis for computation. The new proposal includes a third field, possible sales to third countries.

Financial Reports

Securities prices appear to have reached what Wall Street traders call a trading area where the averages are at a plateau from which news developments may cause minor shifts up or down. Paper mill securities showed the same tendency as the average for all industries.

Net incomes

Chesapeak Corp. of Virginia—Net income in 1956, $3,354,435; in 1955, $3,918,171.

Container Corp. of America—Net income in 1956, $18,230,919; a year ago, $16,411,491.

Federal Paper Board Co. Inc.—Net income in 1956, $4,110,000 as compared with $3,397,000 in 1955.

Fibreboard Paper Products Corp.—Net income in 1956, $5,876,998; in 1955, $5,807,649.

P. H. Glatfelter Co.—Net income in 1956, $2,278,143; a year ago, $2,117,867.

Kimberly-Clark Corp.—Net income for three months ended Jan. 31, 1957, $5,550,578; compared with $5,355,651 in same quarter a year ago.

Lily-Tulip Cup Corp.—Net income in 1956, $6,100,000; in 1955, $5,309,782.

Mead Corp.—Net 1956 income, $13,387,000; $14,750,000 in 1955.

Oswego Falls Corp.—Net income for the year 1956, $1,953,955; in 1955 $2,127,650.

PENNSYLVANIA PLANT LOCATION DATA SERVICE

Special reports and tabulations, tailored to stated location requirements, will be prepared upon request by our engineering and economics staff from central data, files and direct sources, covering:

LABOR—Availability, skills, rates, surplus areas.

MARKETS—Consumer, industrial product, state, regional.

TRANSPORTATION—Water, rail, truck, air transit time, costs.

FINANCING—Community-state industrial building program, lease-purchase, commercial credit.

BUILDINGS—Availability, sizes, location, descriptions.

SITES—Acreage, topography, utility services, photos, maps, industrial districts.

MATERIALS—Metals, industrial chemicals, wood, textiles, farm products.

MINERALS—Location, reserves, potentials, analyses.

WATER—Quantitative, qualitative analyses.

POWER—Capacity, network, industrial service, costs.

FUEL—Coal, oil, natural gas service, costs.

ENGINEERING—Schools, enrollments, specialization, research laboratories, services.

TAXES—Inter-state and community comparisons, assessment ratios, millages, corporate.

COMMUNITIES—Characteristics, size, regions, housing, schools, culture, recreation.

Industrial Representatives Available For Inspection Tours, Conferences And Consultations

For free copy of "Plant Location Services" booklet, or for details on how the PENNSYLVANIA PLAN can provide 100% Financing for your new plant, write or call:

PENNSYLVANIA DEPARTMENT OF COMMERCE
Main Capitol Building, 501 State Street
Harrisburg, Pennsylvania
Phone: CEdar 4-2912

Current Comments . . .

St. Regis Paper Co.—Net income in 1956, $22,502,179; in 1955, $19,047,755.

Scott Paper Co.—Net income in 1956, $22,355,721; in 1955, $21,336,139.

S. D. Warren Co.—Net 1956 income, $4,670,554; in 1955, $2,853,835.

Paper mill corporate changes

Albemarle Paper Mfg. Co. has joined the swing to diversification by taking control of Tredegar Co., a Richmond, Va. iron works.

Doeskin Products Inc. has become a largely controlled agency of Swan-Finch Oil Co., and eventually the two firms will be merged. As part of the shift, Doeskin has purchased Keta Gas & Oil Co. from Swan-Finch.

St. Regis Paper Co. has take over J. Neils Lumber Co. of Portland, Ore., on the basis of 2½ shares of St. Regis common for each share of Neils.

Weyerhaeuser Timber Co. has followed its purchase of southern forest lands with plans to enter the paper container field. Negotiations are underway for the acquisition of Kieckhefer Container Co. and Eddy Paper Corp.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	March 11, 1957	Feb. 9, 1957
Celotex	33⅜	35
Same Pref.	18¾	18⅜
Certain-Teed	10⅝	10¼
Champion P & F	36½	34½
Same Pref.	97	97
Chesapeake Corp.	27¾	28⅛
Container Corp.	18⅝	17¼
Same Pref.	87½	89¼
Crown Zellerbach	51⅜	52½
Same Pref.	96¼	—
Dixie Cup	57½	49
Eastern Corp.	27¼	27½
Federal Paper Board	32½	33
Same Pref.	19⅝	19¾
Fibre Paperboard	30⅝	28½
Same Pref.	103½	98¼
Great Northern	°83½-83¼	79
Hammermill	36	37
International	99⅞	101¼
Same Pref.	°94-96½	98
Kimberly-Clark	43⅞	41⅜
McAndrews & Forbes	°36-37½	38
Marathon	28	29
Masonite	°29¼-30¼	30½
Mead Corp.	36	35
Same pref.	°89-90	85¼
Minnesota & Ontario	36¾	30⅜
Oxford Paper	41¼	38
Same Pref.	°95-97	93
Rayonier	28⅜	29
Riegel	29½	29¾
St. Regis Paper	41¾	40½
Same Pref.	°93⅜-95½	96
Scott	61	58⅞
Same $3.40 Pref.	°84½-87½	—
Same $4.00 Pref.	—	93
Sutherland Paper	37⅜	37
Union Bag-Camp	33⅞	34
United B. & C.	34⅛	34
United Wallpaper	6⅜	7
Same Pref.	°14-14½	14⅞
U. S. Gypsum	54½	54½
Same Pref.	°158½-163	—
West V. P. & P.	43¼	43½
Same Pref.	104	103

New York Stock Exchange — Bonds

Champion P. & F. 3¾%	96¾	—
Champion P. & F. 3¾%	91¾	91⅝
Mead Corp 3¾%	93	92
Scott Paper 3¾%	97½	97½

American Stock Exchange — Stocks

American Writing	23	21⅞
Brown Company	15⅞	16⅜
Puget Sound	16¼	16½

°Closing Bid and Asked Prices.

J. W. MILLER

Beloit Air-Cushioned Inlet **In 1947 Beloit introduced the first air-cushioned inlet to the paper industry. Today, this device is running on practically all grades of paper, with machines so equipped operating at speeds averaging over two thousand feet per minute. For other details and advantages see following page.**

BELOIT AIR-CUSHIONED INLET

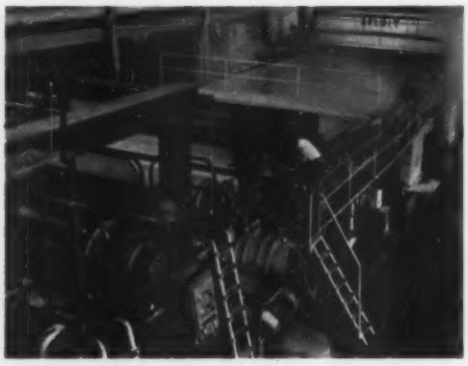
Positive controllable flow and other advantages for the modern paper mill

Development of the Beloit air-cushioned inlet resulted from the demand for increased machine speeds. Main objective was to replace the gravity-type headbox which was increasing in height—in some cases reaching to the overhead mill girders. Because of the great volume of stock present in the gravity-type headbox, dead spots and flocculation were encountered in the flow passages.

The Beloit air-cushioned inlet is designed to maintain a positive controllable flow within the headbox. A predetermined stock level is maintained within the box by the use of air pressure or vacuum. The positioning of rectifier rolls directs a uniform flow of stock through the box. Beloit Iron Works patents cover all of the advanced design features involved.

Beloit air-cushioned inlets are meticulously manufactured. Surfaces coming in contact with the stock flow are clad with stainless steel. All welds are ground smooth and the inside of the box is completely protected during the manufacturing cycle, thus assuring that there will be no rough surfaces inside to cause stock accumulation.

Over the years the Beloit air-cushioned inlet has gained a reputation of keeping pace with the exacting demands of the paper industry.



- **Controlled Flow**—Predetermined stock level control by air pressure or vacuum; rectifier roll arrangements.
- **Slice Adjustment**—Major vertical adjustments by air motor control; minor vernier adjustments by hand.
- **Construction**—All surfaces coming in contact with stock flow clad with stainless steel.
- **Maintenance**—The very minimum.

your partner in papermaking **BELOIT**

PAPER MACHINERY

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NEWS of the INDUSTRY

NO. 4 PAPER machine building at St. Croix measures 416 by 80 ft. Screen room and grinder room are at the right.

VETERAN erectors at the St. Croix project are Doren Ulven of Beloit Iron Works and Charles Johnson of Elliott Co.

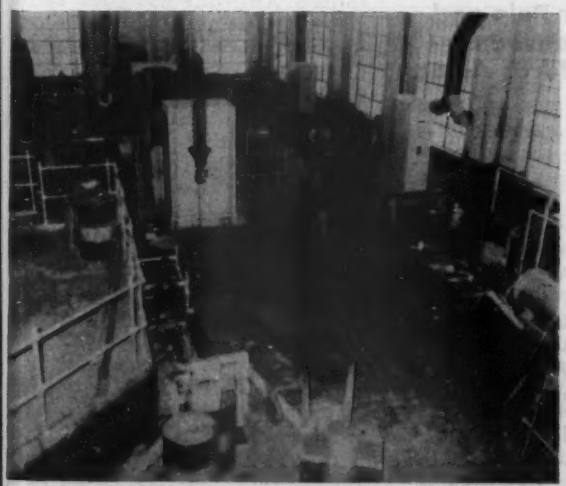
St. Croix Expansion Project Nears Completion at Woodland Mill

NEWSPRINT production is expected early this summer at the new mill of St. Croix Paper Co. in Woodland, Maine. The Beloit Iron Works three-roll fourdrinier machine is being installed at the recently completed machine building. The unit will be No. 4 in St. Croix' line of newsprint producers.

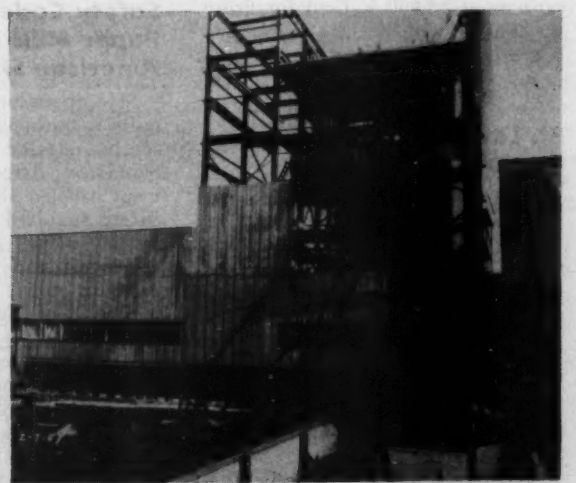
The Beloit machine will take a wire 206 in. in width and produce a trim sheet of 192 in. While it has been designed for a speed of 2500 fpm, it is planned to initially operate the unit at about 1400. The faster speeds would necessitate additional sulfite pulp, requiring further digestion capacity and changes in the acid plant.

In connection with the new machine building (416 by 80 ft.) is additional grinder capacity in a 60- by 140-ft. structure being built to tie in with the over-all expansion. The five new Great Northern units will be similar to those now in use (installed in 1937) with the exception of certain refinements. Each pair of grinders will be operated by a 4000-hp motor. The groundwood capacity is expected to be 150 tons per day.

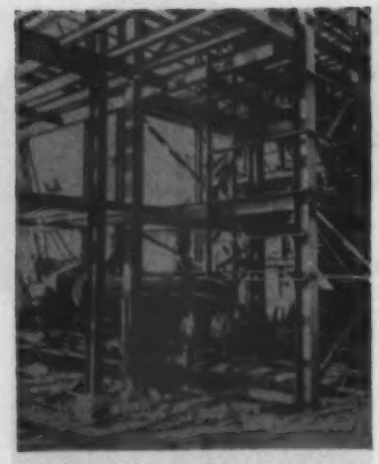
Stock will flow to Johnson screens, and the rejects will be refined for re-entry into the system. The groundwood mill will in effect be a completely closed system with



GENERATOR room at Grand Falls, where two 3400-kva Elliott Co. generators will provide the mill with 60-cycle current.



BOILER DRUMS in place and tubes being installed at the new power plant at the St. Croix mill in Woodland.



ABOUT TO BE raised into position is the highest pressure, highest temperature chemical recovery boiler ever built for the kraft pulping process. Constructed by Babcock & Wilcox Co., the 300-ton recovery unit is located at Continental Can Co.'s Robert Gair Div. in Hodge, La. It is designed to operate at 1250-lb. pressure at the superheater outlet, with a final steam temperature of 900°F.

practically no waste, St. Croix reports.

A "Noteworthy Change"

According to a spokesman for the firm, there will be a "noteworthy change" in the handling of broke. It will be kept separate and processed before it is allowed to re-enter the stock chest. An aluminum hood will enclose the unit, which is expected to save steam and provide a better distribution of heat over the rolls. The hood will be raised and lowered mechanically by pushbutton.

At the new power plant the boiler will provide 125,000 lb. steam per hour at 875 psi. The Allis-Chalmers Mfg. Co. generator has a 12,500-kw capacity at 13,800 v. Coal for firing the boiler will not be pulverized but will be crushed and then burned in a "cyclone".

St. Lawrence Plans Production Boost

St. Lawrence Corp. Ltd. has proposed a capital outlay of about $18,000,000 aimed at realizing the potential of its kraft paper machine in Red Rock, Ont. Since the installation of the 240-in. unit in 1954, pulp capacity has not been sufficient to meet its needs.

Pulp capacity will be expanded — principally in the existing plant — by 125 to 150 tons, bringing daily production to about 450 tons.

The company also plans the construction of a new bleachery with a daily capacity of 100 to 300 tons. It will thus be able to bleach its own kraft pulp for newsprint and for high-brightness linerboard. (Currently, St. Lawrence buys its sulfite pulp from outside sources.)

Expansion of newsprint production at mills in Dolbeau and Trois Rivieres, Que., is already underway to raise annual capacity by 40,000 tons.

Rhinelander to Expand Power Plant Facilities

A $4,000,000 power plant expansion program has been reported at Rhinelander Paper Co. in Rhinelander, Wis.

Work will begin this fall, with completion scheduled for the spring of 1958. Included is the installation of a 10,000-kw capacity turbine and a 260,000-lb. per hr. steam boiler. The latter will operate at 1500 psi at 950° F.

Tappi Plastics-Paper Conference Plans

Further plans have been announced for the program of the fall Tappi Paper-Plastics Conference, which is to be held October 7-9 at the Sheraton-Gibson Hotel in Cincinnati.

Discussions are planned for the following subjects: Plastics-Coated Papers and Board in Packaging; Synthetic Fibers and Additives in Papermaking; Raw Materials (resins and papers) Used in Fibrous Materials for Laminates, and Finished Rigid Products Manufactured from Paper-Resin Combinations.

The program will also include a tour of the Evendale plant of Formica Corp., manufacturer of laminates.

Safety Code for Pulp and Paper Mills Released by American Standards Assoc.

Safe operation of pulp and paper mills is outlined in a new code recently released by the American Standards Association. The document, labeled "Pl. 1-1956, American Safety Standard for Pulp and Paper Mills", covers measures to protect employees and property in all operations of the industry (with the exception of logging and pulpwood transportation).

Protection for workers includes safety regulations for guards, protective clothing, floors and platforms, lockouts and power trucks. Whenever possible, according to the code, all dust fumes and gases incident to handling materials shall be controlled at the source. Where not possible, respirators shall be provided for workers handling alum, clay, soda ash, lime, bleach powder, sulfur, caustic soda, chlorine and similar materials. When handling liquid acid or alkali, workmen must be given approved eye and face protection, rubber gloves and protective equipment.

Knocking on Wood Outlawed

Knocking down wood from the woodpile must be done by special mechanical equipment — not by hand. And only authorized men shall be allowed to dynamite the woodpile.

A safe guillotine? If made and used according to the safety code's three provisions, there is no danger from the guillotine-type cutter: (1) Each guillotine-type cutter shall be equipped with a control that requires the operator to use both hands; (2) each cutter shall be equipped with a non-repeat device, and (3) carriers shall be provided for the transportation of knives.

Several chapters of the code are devoted to the preparation of pulpwood, including saws, hand and machine barking, splitters and chippers. In the section on the beater room, safety requirements cover beaters and washers and recently developed equipment.

Cooperation of NSC

The committee that wrote the code was composed of representatives of the pulp and paper industry, trade associations, labor unions, insurance firms, manufacturers of pulp and paper mill machinery and equipment and government agencies.

In addition to the general committee, several subcommittees were formed. Assistance was given by the executive committee of the Pulp & Paper Section of the National Safety Council. (At the 1956 National Safety Congress the section expressed "great satisfaction with the accomplishment of the committee".)

Copies of the code at $1.00 per copy can be obtained from the American Standards Association, 70 East 45th St., New York 17, N. Y.

Southwest Lumber Plans

Southwest Lumber Mills is definitely committed to build a 200-ton pulp and paper mill near Springerville, Ariz. The mill, which will employ about 400, is expected to cost between $30,000,000 and $40,000,000.

According to an agreement with the United States Forest Service, the plant must be in operation by March 1, 1962.

Cardatype accounting system installed as . . .

Automation Speeds Order Handling at Nekoosa-Edwards

ORDER PROCESSING at Nekoosa-Edwards Paper Co. in Port Edwards, Wis., has been automated. The result: reduced errors, speedier flow and better inventory-production control. The right products get to the right place at the right time.

Simply stated, automation is the use of a "boss" machine to operate a second machine, which in turn controls the first. In the Nekoosa-Edwards order room, "the process utilizes and synchronizes modern electronic accounting equipment to provide fast and accurate service to customers."

Basic component parts of the installation consist of three Cardatype accounting machines (IBM), each of which operates an electric typewriter.

The System at Work

When an order is received and is ready to be processed, pre-punched cards relating to the order are selected from a "tub" file. The cards contain certain constant information such as name and address, routing data, product description, etc.

The cards are then inserted into the Cardatype unit, which transfers the information through an intricately-wired brain center to an automatically-operated electric typewriter.

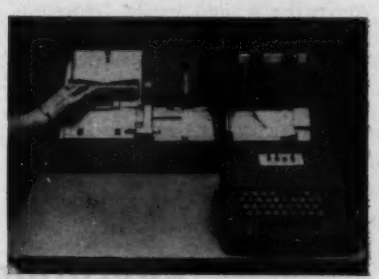
While the "constant" information is being processed, variables are added by the operator by punching a keyboard. This provides required additional data such as the invoice number, quantity ordered and price.

Price computations and conversion of carton quantities to weights are made by the machine, thus avoiding human failure. The electric typewriter types an order master, which is sent to the multilith department where copies are prepared for manufacturing and inventory departments, the salesman, customer's acknowledgment and the file and shipping departments. Each order and invoice processed in this manner is also automatically recorded on a separate card (the "output card") to provide immediate and accurate data for scheduling, sales and inventory records.

LINE-UP of three Cardatypes at the Nekoosa-Edwards main office.

PRE-PUNCHED cards are selected from the "tub" file.

ADDITIONAL variable information is added by keyboard.



DATA is recorded on "output card" that is then sent to tabulating.

Diamond Match and Gardner Board Plan Merger

Gardner Board & Carton Co. of Middletown, Ohio, and Diamond Match Co. have jointly announced merger plans, subject to stockholder approval.

In a statement, Robert G. Fairburn, president of Diamond Match, had this to say: "The merger with Gardner represents further important diversification of the Diamond Match Co . . . Gardner is expected to contribute materially to the expansion of Diamond in the packaging field, where we have already made considerable progress. Last year, 31 per cent of Diamond sales came from food packaging products, as compared to 15 per cent of 1947 sales."

Gardner makes paperboard and cartons in plants located at Middletown and Lockland, Ohio. In subsidiary plants in Ohio and Massachusetts it produces custom papermaking machinery, corrugated shipping containers, printing engravings and color lithography.

Diamond's principal products are molded pulp and packaging, matches and wooden-wares and lumber.

Commercial Production of Synthetic-Fiber Paper Foreseen Within a Year

Commercial production of paper made from synthetic fibers is foreseen within a year. This according the view of leading papermakers and E. I. DuPont de Nemours & Co. Inc.

For example, recent developments resulting from DuPont research have included specially-treated fibers of nylon, Dacron polyester fiber and Orlon acrylic fiber, and the development of special techniques that permit the cutting of these fibers to short lengths without fiber fusion or the presence of long fibers.

Fibers can be obtained in ¼- and ⅛-in. lengths with a diameter of 0.7 mils.

Synthetic-fiber paper has little resemblance to paper from wood fibers. The term is applied because it is manufactured on conventional papermaking machinery. A more apt definition might be, "non-woven bonded paper-like structures." A diversified range of appearances and characteristics is possible, ranging from drapable fabric

and felt-like structures to crisp papers or tough parchments.

Papers made from synthetic fibers show excellent resistance to corrosive chemicals, bacteria, heat and moisture, as well as high strength, outdoor durability, excellent dimensional stability and good dielectric properties.

Mead Builds Neutral Sulfite Recovery Plant at Virginia Mill

Construction of a neutral sulfite recovery plant is underway at the Heald Div. of the Mead Corp. in Lynchburg, Va. Cost of the stream pollution project is expected to be more than $2,700,000.

Boiler and chemical recovery equipment is being designed, built and installed by the Babcock & Wilcox Co. Evaporators and washers are being supplied by Swenson Evaporator Co.

The plant designed to reduce river pollution consists principally of equipment for removing waste now discharged into the James River and for converting it into useable chemicals. Waste will be washed from the pulp and concentrated in the evaporators to a point where it can be burned in a furnace. The resulting ash will be converted to chemicals suitable for reuse in the pulp mill.

Operation of the recovery plant is scheduled for November. While the firm does not plan an increase in mill production, the new equipment has been designed to handle waste approximately 65 per cent greater than that now coming from the mill. At peak volumes the new process is expected to remove approximately 60-70 per cent of harmful solids and organic material.

Marathon Slows Down Expansion Program

In an announcement at Menasha, Wis., Marathon Corp. has revealed that it is scaling down its $82,000,000 growth and modernization program. The investment will be spread over six years instead of the four-year period originally planned.

A spokesman for the firm explained that the extension "is more in line with our current estimates of the normal growth in our volume of business as projected for the remaining five years to 1961 inclusive."

By the end of 1959, Marathon expects to have spent $57,000,000.

The slow-down does not affect the pulp and paper mill now under construction in Alabama. Pulp production at the plant is expected in April 1958, followed by the first paper machine in May and the second in September.

American Can Reported to be Eying Papermaking

It has been reported in the *New York Journal of Commerce* that American Can Co. has decided to enter the papermaking field through acquisition of a mill plus necessary forest resources.

The firm, which is ranked among the world's largest producers of tin cans and converters of paper milk containers, would be in line with recent trends in the packaging fields as companies integrate operations and diversify product lines.

No arrangements have as yet been made toward purchase of mill facilities. However, American Can has expressed optimism that some action will be taken during 1957.

Alaska Pine & Cellulose Expansion Scheduled for Late Summer Completion

Completion of new facilities for the production of dissolving pulp is scheduled for late summer at the Port Alice, B. C. mill of Alaska Pine & Cellulose Ltd. The announcement was made by W. E. Breitenbach, executive vice president of the Rayonier Inc. subsidiary.

A 175-in. Black-Clawson Co. pulp-drying machine is to be installed. Its design production capacity has been reported at 350 daily tons of dissolving pulp at speeds of from 150 to 360 fpm. The unit will feature a permanent cantilever fourdrinier with an integrally-mounted suction couch roll assembly to facilitate quick wire changes and will be hydraulically-controlled throughout.

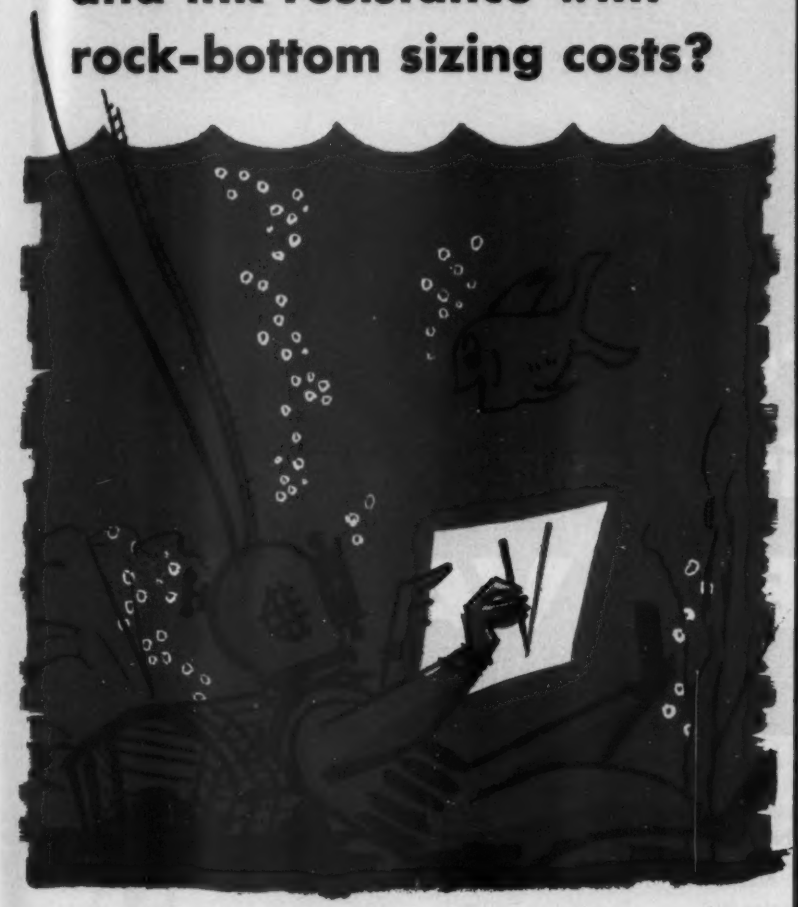
The press part will comprise a 36-in. suction first press, four 48-in. diameter pre-dryers, plain second press and a plain third press. A total

Education: Expanding with the Industry

HUGH P. BAKER Laboratory at the New York State University College of Forestry in Syracuse will be dedicated May 2 and 3. The $3,750,000 ultra-modern structure will make it possible for more graduates with professional training to enter the wood-using industries. Additionally, equipment of the latest design will enable research in many of the problems facing these industries.

NEW PAPER Industry Laboratories at Western Michigan College in Kalamazoo are now in use. Built as an addition to McCracken Hall, the structure provides an additional 12,000 sq. ft. of office and instructional area. The structure was made possible through gifts from the pulp and paper industry, its suppliers and interested individuals, together with a $125,000 legislative appropriation.

Want to get better water and ink resistance with rock-bottom sizing costs?



here's how!

Reduce your rosin size charge to the beater by 30 to 50%. Substitute for the rosin size a fraction of its weight of Cyanamid's ALWAX* or WAXINE® Size. Your size costs will be lower, but more important, your paper or paperboard will be improved in these qualities:

- Water Resistance
- Surface Smoothness
- Scuffing Resistance
- Superior Foldability
- Curling Resistance
- Ease of Finishing
- Even Calender Staining

Whatever your problems in wax sizes and their application, chances are that Cyanamid has just the product and know-how needed to help you. We make more types and grades (17) of wax size than any other supplier (and we sell more than everyone else combined)! Our long years of leadership and anxious-to-help service seem to be the main reasons why paper companies turn to us first for assistance and information. So don't give up on wax-sizing problems — call your Cyanamid man.

More about ALWAX and WAXINE sizes

ALWAX Sizes are a group of acid- and alkaline-stable aqueous emulsions of paraffin and microcrystalline waxes with 40 to 50% solids content.

WAXINE Sizes are blends of various petroleum waxes combined with rosin in acid-stable aqueous emulsions of 50% solids content.

Beater Application is particularly desirable, as moderate amounts of these size additives can be incorporated without producing undesirable surface slip.

Size Tub Application is commonly practiced by adding the emulsion with a thin boiling starch solution to improve surface qualities and increase water repellency. Proteins can be used in conjunction with alkali-stable emulsions.

Calender Box Application on paperboard uses combinations of starch and acid-stable ALWAX. High water repellency is produced by ALWAX alone at greater concentrations.

Clay Coatings benefit from the addition of certain ALWAX emulsions to the starch, casein or protein. The ALWAX alone is added to the coating mixture after mechanical treatment.

Emulsion Stability is excellent, even under the mechanical, heat and chemical conditions met in papermaking.

Detailed recommendations on specific size applications are contained in Cyanamid's 12-page Technical Bulletin, "ALWAX and WAXINE Sizes." For your copy, write to the address below.

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...more quality proved POWELL VALVES

FIG. 2309—Flush Bottom Tank Valve for 150 Pounds W.P.

FIG. 2491—Stainless Steel O.S.& Y. Gate Valve for 150 Pounds W.P.

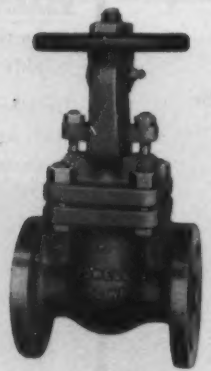


FIG. 1886—Stainless Steel Liquid Level Gauge for 350 Pounds W.W.P. Offset pattern.

FIG. 2107—Stainless Steel "Y" Valve for 150 Pounds W.P.

for dependable flow control

Consult your Powell Valve distributor for full facts about quality proved bronze, iron, steel and corrosion-resistant valves. For every flow control problem—there is a Powell Valve to solve it.

THE WM. POWELL COMPANY, CINCINNATI 22, OHIO . . . 111th YEAR

of 98 dryers of 48-in. diameter arranged in five vertical sections make up the dryer group. Following the dryers will be a set of draw rolls and a two-drum upright reel for handling rolls (up to 84 in. in diameter) of dry dissolving pulp.

The present expansion at Port Alice is being undertaken at a cost of $13,000,000.

Institute to Stage Second Seminar

The Second Industry Seminar will be conducted by the Institute of Paper Chemistry in Appleton, Wis., between June 16 and July 11. The program is designed to give men in the pulp and paper industry an increased understanding and appreciation of scientific, technical, economic and human developments.

The general theme, "Water-Derived Problems of the Pulp and Paper Industry", will serve to give continuity to the wide diversity of subjects that will be considered. The facets of the theme will include: water supply, wood growth, plant physiology, pulping, beating and refining, bleaching, converting, formation, drainage, additives and waste disposal.

A study of watershed management will be supplemented by a three-day field trip through the Wisconsin River Valley.

Further discussions of subjects not directly related to the general theme will include: chemical components of wood, considerations of wood as a raw material, mechanical properties of wood fibers in relation to end use, genetics, graphic arts, economics and communication.

Cellulose Research Institute Established at Syracuse

The State University College of Forestry at Syracuse, N. Y., has established a Cellulose Research Institute — a partnership between industry and the academic world.

Director of the venture is Dr. J. J. Hermans, formerly professor of physical chemistry and director of the laboratory for inorganic and physical chemistry at the University of Leiden, the Netherlands.

Charter industrial members are American Viscose Corp.; Buckeye Cellulose Corp.; Celanese Corp. of America, and Hercules Powder Co.

Primary objective of the Institute is to provide a central source of fundamental knowledge serving as a basis for industrial development and growth. The program will be basic research in fundamentals relating to cellulose.

Battelle Studies Forest Protection Program

Battelle Memorial Institute of Columbus, Ohio, has signed a contract with the United States Forest Service calling for a study of the ways in which the federal government, states and private landowners can share the cost of protecting non-federal lands from forest fires.

The study will determine the dollar value of the resources of non-federal forest and watershed lands that should be protected from fire. It will include the degree of protection needed, the protection now given and the extent to which public agencies and private owners should share in the cost of such protection.

Considered will be such things as the number of wood-using industries dependent on the forest crop, the number of people employed in these industries, the volume and value of water from these lands and the expenditures already made for water control.

Recent Expansions in the Industry

E. B. Eddy Co.
of Hull, Que., will launch a $6,000,000 expansion program that will include a new 40-ton tissue machine.

Weyerhaeuser Timber Co.
will definitely build a paper mill in the Columbus, Miss. area, according to a spokesman for the Tacoma, Wash. firm. Cost of the plant will be well in excess of $30,000,000.

Bowater's Newfoundland Pulp & Paper Mills Ltd.
at Corner Brook, Nfld., plans to boost daily newsprint production to 1100 tons by the end of the year. The capacity expansion will be realized through the speed-up of the firm's seven machines and the installation of auxiliary equipment.

Continental Can Co. Inc.'s
Robert Gair Div. has acquired a 40-acre tract at Tyler, Texas, for the construction of a corrugated shipping container plant.

Hammermill Paper Co.
will construct two office buildings at Erie, Pa. Cost of the structures, to be engineered and constructed by Rust Engineering Co., will be more than $1,000,000.

Fibreboard Paper Products Corp.
will double its food carton capacity in the Los Angeles area within the next two years at a cost of $10,000,000. (An over-all $50,000,000 five-year expansion will include two pulp and paperboard plants.)

Continental Paper Products Ltd.,
a subsidiary of Canadian International Paper Co., has put into operation its new kraft multiwall bag plant at Regina, Sask. The facility will serve industrial users in western Canada.

Embry Container Corp.
of Louisville, Ky., an affiliate of Alton Box Board Co., has announced a $500,000 expansion program to increase the production of corrugated shipping containers. Equipment to be installed in a new building will include an 85-in. corrugator and printing and sealing machinery.

Growers Container Corp.'s
new $2,500,000 plant for the production of corrugated boxes at Fullerton, Cal., was scheduled for completion in March.

St. Regis Paper Co.
has installed at its West Carthage, N. Y. mill a 20-ft. pilot machine devoted to research in water-based coating processes — primarily printing papers. It may also be used for protective

FORTY-ONE acres of land owned by the City of Philadelphia is signed over to Scott Paper Co., which will build a $4,000,000 office building on the site. In the picture (l to r): Fredric R. Mann, city director of commerce; Mayor Richardson Dilworth, and Thomas B. McCabe, Scott president.

News of the Industry . . .

packaging papers. Built over a four-year period, the unit handles 12-in. paper in weights of up to heavy board and is capable of speeds up to 600 fpm.

Veracruz Paper & Fiber Co.
at Orizaba, Mex., has in operation a pilot plant for the production of cellulose from bamboo. The annual capacity is 1000 tons.

St. Regis Paper Co.
announced in February that it would make an offer to the holders of St. Paul & Tacoma Lumber Co. common stock to exchange their shares for shares of St. Regis common. St. Paul & Tacoma manufactures and distributes plywood, lumber and wood chips. The chips are sold to the St. Regis pulp mill in Tacoma, Wash. The lumber firm, with headquarters in the Washington city, owns 133,700 acres of fir and hemlock timberlands.

Yorkville Paper Co. Inc.
of New York, N. Y., has announced that its Safeway Products Div. has entered the rigid container field.

Armstrong Cork Co.
at Macon, Ga., has announced a major expansion project to increase its production of acoustical ceiling tile. The project — scheduled for completion in July — follows by less than one year the inital operation of Armstrong Cork's second board mill.

Minnesota Mining & Mfg. Co.
has purchased KEL-F, chemical manufacturing operation of M. W. Kellogg Co., a subsidiary of Pullman Inc. Minnesota Mining will develop additional uses for high-temperature, corrosion-resistant resins. (Minnesota Mining owns Hartford City Paper Co. of Hartford City, Ind.)

St. Regis Paper Co.
has obtained 60-year timber cutting and management rights on 100,000 acres in southern Alabama.

Standard Packaging Corp.
plans the acquisition of four packaging manufacturers with total annual sales of $8,000,000. The four: Fuller Label & Box Co., Pittsburgh; Allegheny Label Inc., Cheswick, Pa.; Gebhart Folding Box Co. Inc., Dayton, Ohio, and Bradley & Gilbert Co. Inc., Louisville, Ky.

Oxford Paper Co.
of Rumford, Maine, has made "one of the largest single purchases of timberlands" in the history of the state. The transaction involves approximately 70 per cent undivided interest in 203,000 acres of softwood lands.

Crown Zellerbach Corp.
has purchased 30 acres of industrial property and optioned an additional 20 in St. Louis for a projected multi-million dollar plant for the production of flexible packaging materials. The plant would be operated by the Western-Waxide Specialty Packaging Div.

Continental Can Co.
has announced that all the manufacturing and sales activities of the former Robert Gair Co. Inc., together with those of the parent firm's Fibre Drum and Paperboard divisions, have been incorporated into the new Robert Gair Div.

Union Point Box Co.,
organized about a year ago at Savannah, Ga., has placed in operation a plant for the production of paperboard boxes.

Consolidated Paper Mfg. Co.,
Los Angeles producer of napkins and toilet tissues, will construct a 100,000-sq. ft. plant at a cost of $500,000.

Orchard Paper Co.
of St. Louis has announced a change of name for its newly acquired subsidiary, Associated Paper Converting Corp. of Los Angeles. Effective February 4, the West Coast firm is known as Orchard Pacific Paper Co.

Allied News Briefs . . .

American Industrial Clays Inc. is establishing a new clay mining and processing operation at Sandersville, Ga. Most of the output will be clays for the paper industry.

Arnold, Hoffman & Co. Inc. will build a plant at Dighton, Mass., for the manufacture of Procion dyes. Operation is expected in early summer.

Bauer Bros. Co. has opened an eastern sales office in Springfield, Mass. LeRoy Bauer has been named manager.

Hercules Powder Co. has begun operation of its new tall oil fractionation plant at Savannah, Ga. Production includes resins, purified fatty acids and related products.

Mount Vernon Mills Inc. has purchased Lawrence Duck Mills of Lawrence, Mass., a producer of dryer felts.

American Cyanamid Co.'s Industrial Chemicals Div. will install calcining facilities at Bauxite, Ark., to provide more ore for the making of aluminum sulfate.

National Starch Products Inc. has reported that John D. Beggs, sales manager of the Resin Div., has moved to the Los Angeles office.

Bulkley Dunton Pulp Co. has opened offices in Paris, Stuttgart and Zurich.

Frank W. Egan & Co. will double the size of its Somerville, N. J. plant. The 16,000-ft. addition will be completed by late summer.

Research-Cottrell (Canada) Ltd. has been established in Toronto as a subsidiary of Research-Cottrell Inc. of Bound Brook, N. J.

Coming Events

Tappi

May 20-23—Eighth Coating Conference, Pfister Hotel, Milwaukee
May 24-25—Southeastern Section, Savannah, Ga.

Superintendents Association

April 27—Michigan Div. (ladies night), Hotel Harris, Kalamazoo
April 30—Miami Valley Div., Manchester Hotel, Middletown, Ohio
May 3—Connecticut Valley Div., Roger Smith Hotel, Holyoke, Mass.
May 10-11—Penjerdel Div. (spring meeting), Hotel Stacy-Trent, Trenton, N. J.
May 16—Michigan Div., Hotel Harris, Kalamazoo
May 21-23—National Meeting, Congress Hotel, Chicago

Other Meetings

April 24-25—National Industrial Research Conference, Conrad Hilton Hotel, Chicago
April 24-26—Sanitary Engineering Conference on Solids Handling and Anerobic Digestion, Manhattan College, New York, N. Y.
April 27-May 2—Scientific Apparatus Makers Association (annual meeting), Greenbrier, White Sulphur Springs, W. Va.
April 29-May 1—Southern Pulp & Paper Safety Association (annual meeting), George Washington Hotel, Jacksonville, Fla.
May 1-3—National Box Manufacturers Association (annual meeting), Eden Roc Hotel, Miami Beach
May 22-24—American Society for Quality Control (annual meeting), Masonic Temple, Detroit

A veteran Albany Felt Sales Engineer discusses an operating problem with a machine tender.

Sales Engineer John Howell (left foreground) discusses felt designs at a meeting of Albany Felt Service Engineers, Designers and Manufacturing personnel. Below, trainees for the Sales Engineering staff work in every manufacturing department to learn felt-making processes.

Meet the men who can help YOUR machines run better!

This may sound like a broad statement, but Albany Felt Company's Sales Engineers are doing just that, almost every day of the year. Their years of technical training and experience in the field have been devoted to one purpose — to serve you better!

Your Albany Sales Engineer is ready to help you solve problems related to felt performance. Albany's outstanding Service Engineers, Designers, research and manufacturing specialists — also are available to develop a quick solution. Even after this has been found, your Sales Engineer will be on hand to follow up the case in question, to be sure you continue to achieve top performance from your Albany Felts.

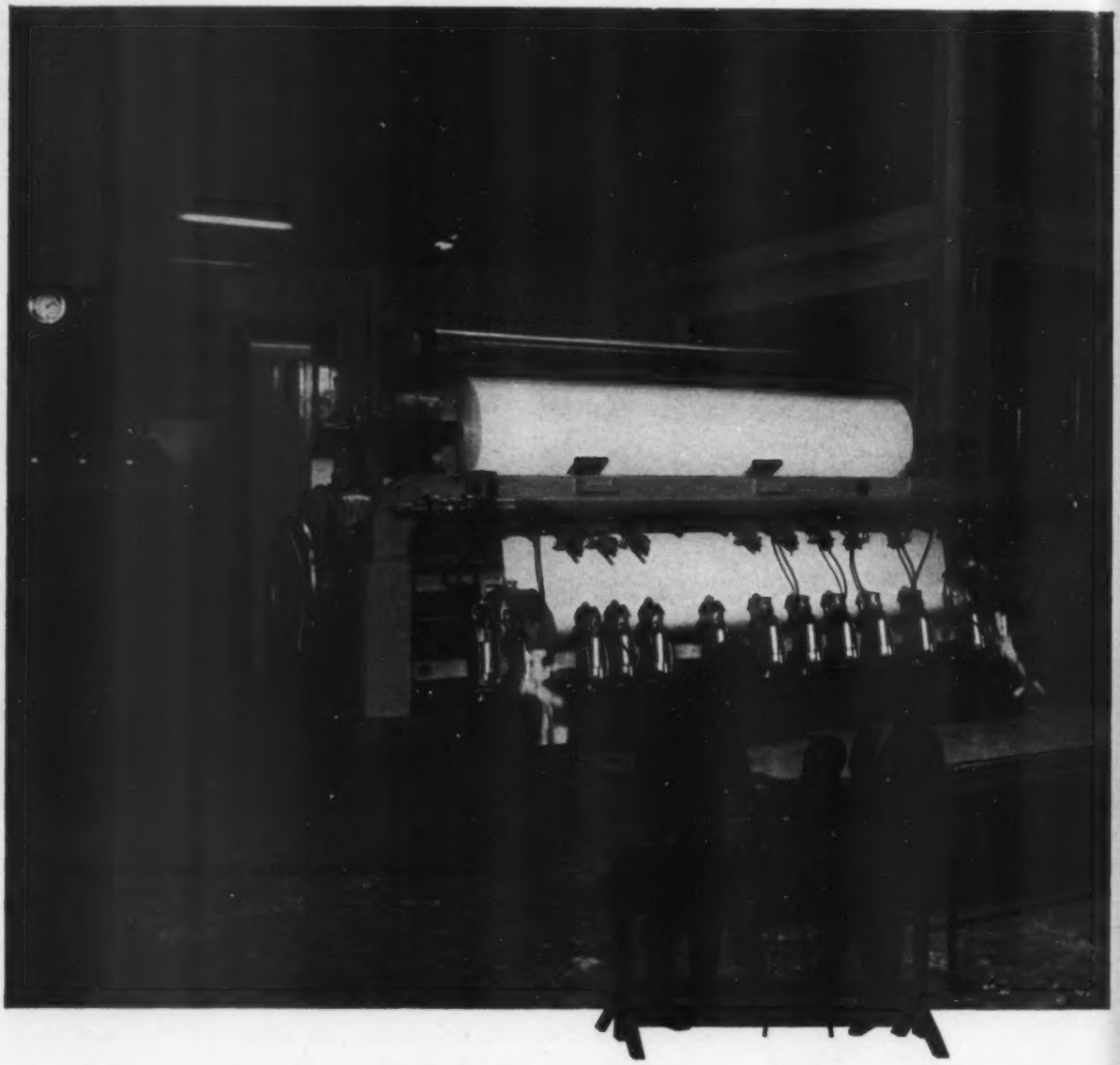
Let your Albany Sales Engineer make regular felt performance checks on your machines — you'll find it will pay off in improved efficiency and trouble-free performance. His goal, as always, to help you produce ***more saleable tons per day!***

ALBANY

FELT COMPANY

Main Office & Plant, Albany, N.Y. Other plants: Hoosick Falls, N.Y.
N. Monmouth, Me., St. Stephen, S.C., Cowansville, P.Q.

"THE WORLD'S LARGEST MANUFACTURER OF PAPER MACHINE FELTS"



Designing and building only the best

Vibration-free operation . . . accurate, uniform slitting and winding of converter rolls . . . automatic controls for efficient performance! Rigid requirements to meet, so the Appleton Machine Company was selected to do the job.

And from Appleton's experienced design and production staff comes the most compact, low contour "push-button" winder available. The entire operation of this precision winder is pre-set. It requires only minimum attention by the operator. Custom-designed, custom-built, of course!

Ask your Appleton representative about the unusually efficient performance of this "push-button" winder with low center of gravity next time he calls.

KNOWING AND FILLING
THE NEEDS OF THE PAPER INDUSTRY

APPLETON MACHINE COMPANY

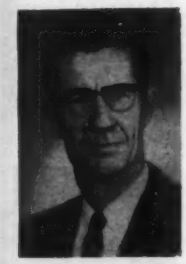
APPLETON, WISCONSIN

NAMES in the NEWS

Warren Bullock Retires

Warren Bullock, manager of the Import Committee of the American Paper Industry, has announced his retirement after 33 years of service to the group that he established in 1924.

Bullock was on the staff of the American Paper & Pulp Association for three years prior to 1924. He has been the committee's only manager. The import group under Bullock's direction has been an effective instrument in checking unfair foreign competition affecting every grade of paper and paperboard.



L. W. Murtfeldt (upper left)

Stratton Martin (upper right)

William J. Foote (left)

Consolidated Water Power & Paper Appointments

Four executive changes have been reported by Consolidated Water Power & Paper Co. in Wisconsin Rapids, Wis.

C. E. Jackson, book mills production manager and division manager at Wisconsin Rapids, retired April 1 following 43 years with the firm.

Succeeding Jackson as mill manager is L. W. Murtfeldt, a veteran of 24 years with the company and for the past year assistant mill manager. Succeeding Jackson as Wisconsin Rapids Div. manager is Stratton Martin, secretary to the vice president for manufacturing.

FIFTY YEARS of service together has been celebrated by four veterans at the Carolina Div. of Champion Paper & Fibre Co. in Canton, N. C. (The division marked its 50th anniversary in 1956.) The four are (l to r): Roy J. Trammell, superintendent of board manufacturing; J. Latch Worley, time office supervisor; Reuben B. Robertson, president and chairman of the board, and Craig Allen, diesel engineer in the woodyard.

William J. Foote, formerly manager of the Wisconsin River Div. in Whiting, becomes director for book paper manufacture. He joined Consolidated in 1938 as chief chemist.

In other appointments, Jack E. Chinn, mill chemist, has been named assistant to the paper machine superintendent at Wisconsin Rapids. Succeeding him as mill chemist is Hugh D. Burnie, formerly assistant coating superintendent.

Canadian Institute Names Six to New Posts

The Pulp & Paper Research Institute of Canada in Montreal has made the following appointments effective immediately:

W. H. Gauvin, associate professor of chemical engineering at McGill University and consultant to the Institute, becomes head of the research organization's newly formed Chemical Engineering Div.

Dr. J. E. Stone, formerly of the Institute of Paper Chemistry in Appleton, Wis., has been named assistant head of the Chemical Pulping Div.

Dr. Raimbault de Montigny has been named first chairman of the newly formed Technical Services Department. He was formerly technical director for E. B. Eddy Co.

George W. Legg, formerly of Cellulose Development Corp. in London, becomes associate chemical engineer in the Chemical Pulping Div. Dr. Leo Yaffe, associate professor of chemistry at McGill, becomes consultant in radiochemistry. And Dr. A. M. Ayroud of Grenoble, France, where he has been associated with Ecole Francaise de Papeterie in a research capacity, becomes chemical engineer on the Institute's research staff.

A. M. Schmalz

Fred Herbolzheimer

Thilmany Elects Schmalz

A. M. Schmalz, previously production manager, has been elected a vice president of Thilmany Pulp & Paper Co. of Kaukauna, Wis. He will act as coordinator of paper and new equipment.

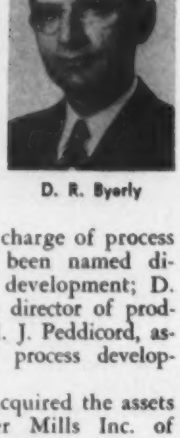
Schmalz joined the Thilco staff in 1905 and since that time has worked on practically every machine and in the various converting departments.

In another Thilmany appointment, Fred Herbolzheimer has been named production services superintendent. He was formerly production manager of the Marinette, Wis. mill of Marinette Paper Co., a subsidiary of Scott Paper Co.

P&G Appointments

Three appointments to the technical staff of Procter & Gamble Co.'s newly formed Paper Products Div. have been recently announced:

Victor Mills



D. R. Byerly

Victor Mills, in charge of process development, has been named director of product development; D. R. Byerly, associate director of product research, and H. J. Peddicord, associate director of process development.

(P&G recently acquired the assets of Charmin Paper Mills Inc. of Green Bay, Wis.)

Georgia-Pacific Names Shelton Vice President

W. J. Shelton, resident manager of the kraft pulp and paper mill being built at Toledo, Ore., has been named vice president of Georgia-Pacific Corp. Prior to becoming associated with G-P, he was superintendent of pulp and paper manufacture for Longview Fibre Co. in Longview, Wash.

(The Toledo mill construction is proceding on schedule. The plant will have a daily capacity of 250 tons of unbleached kraft pulp, paper and container board.)

L. R. Edwards

G. J. Schneider

National Container Names Nine to New Posts

Nine key executive assignments in National Container Corp., a subsidiary of Owens-Illinois Glass Co., and in O-I's Mill and Multiwall Bag divisions have been recently reported:

Lester R. Edwards, vice president of National Container, is general manager of the subsidiary. George J. Schneider, executive vice president of National Container of California, is now its general manager with responsibility for West Coast box plant operations.

C. G. McLaren, vice president of the Mill Div., is named general manager of mill and woodlands operations in Wisconsin, Virginia, Florida, Georgia and the Bahamas. John D. Northup, also a vice president of the Mill Div., is now in charge of both sales and production planning for the division.

Other appointments include: Max Ackerman as comptroller; Donald B. Malcolm as director of personnel administration for National Container and the two divisions; Joseph Gruneisel as assistant to Edwards with responsibility for programming new plant facilities and expansions; F. W. Wallis as general production manager for corrugated box operations, and A. F. Carroll as general manager of the Multiwall Bag Div.

Scott Promotes Two

Scott Paper Co. has announced the promotions of John A. Shaler and Robert J. Kitchen.

Shaler, paper mill divisional superintendent at the Chester, Pa. mill, becomes superintendent of the new tissue mill in Mobile, Ala. He joined the firm in 1925 as a third hand, became a machine tender in 1932, a division shift manager in 1943 and divisional superintendent in 1954.

Kitchen has been named assistant to the paper mill superintendent at Marinette, Wis. Superintendent E. J. Walk will retire at the end of this year, at which time Kitchen will assume the top post. He has been superintendent at South Glens Falls, N. Y., since 1953.

Gordon S. J. Bowell has been named vice president for pulp and paper of MacMillan & Bloedel Ltd. He was formerly general manager of the Western District operations (excluding pulp and paper). Bowell succeeds **Clifford Crispin,** who has assumed other executive duties.

Fred M. Hodgemire, vice president in charge of production, has been selected vice president of Hawthorne Paper Co. of Kalamazoo, Mich., as has Louis J. Slavin, a 1955 graduate of the University of Michigan. Hodgemire was for 32 years general superintendent and is considered an expert in the rag content and sulfite fields.

C. S. Cullenbine has been elected secretary of Crown Zellerbach Corp. to replace **D. R. Schmidt,** who has been appointed general manager of Canadian Western Lumber Co. Ltd. Cullenbine was formerly secretary and counsel for the Gaylord Container Corp. Div.

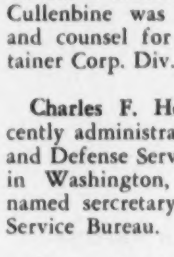
Charles F. Honeywell, until recently administrator of the Business and Defense Services Administration in Washington, D. C., has been named secretary of the Newsprint Service Bureau.

John G. Robinson, formerly hardboard superintendent for Weyerhaeuser Timber Co. in Klamath Falls, Ore., has joined the recently formed Bowaters Fibreboard Co. as superintendent. He was at one time a process engineer and assistant power superintendent for Rhinelander (Wis.) Paper Co. Robinson is succeeded at Klamath Falls by **Norman J. Briggs,** former supervisor of process controls.

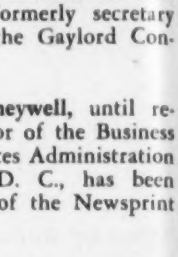
J. G. Robinson

N. I. Bearse

Norman I. Bearse, vice president of production, has been named first vice president of Champion-International Co. in Lawrence, Mass. He has been with the firm since 1936, when he was named technical director. In 1956 he was elected to the executive committee.



E. A. Meyer



W. F. Adrian

Badger Paper Mills Inc. of Peshtigo, Wis., has reported the following new officers: **E. A. Meyer,** former president, treasurer and general manager, becomes chairman of the board; **W. F. Adrian** to succeed Meyer; **E. E. Erdmann** as vice president and sales manager for waxed paper; **W. J. Van Dyck** as vice president and sales manager for fine pa-

Names in the News . . .

per; **E. A. Meyer Jr.** as secretary, and **S. E. Eastman** as assistant secretary and assistant treasurer.

Bernard M. Hoey, former sales manager for Minnesota Mining & Mfg. Co., has been named vice president and a director of Case Bros. Inc. of Manchester, Conn.

Allied Personalities . . .

Norman H. Laughrey, formerly head of the chemistry lab of McLaurin-Jones, has joined the Dilts Div. of Black-Clawson Co. as technical service director.

Joseph Tanner, since 1944 a sales engineer for Albany Felt Co., has received the National Sales Executives "Oscar" as the firm's outstanding salesman of 1956.

Stephen W. Benedict, vice president of research and engineering since 1955, has been made executive vice president of Master Builders Co.

William H. Reeves, vice president for 15 years, has been named president of Layne & Bowler Inc. He succeeds **James I. Seay,** now board chairman.

A. R. Olsen, manager of CMC sales, has been named sales manager of the Cellulose & Chemicals Div. of Hercules Powder Co.'s Virginia cellulose department.

Clifford T. Fogarty, in the papermaking field since 1942, has joined Morningstar, Nicol Inc. as southwestern representative.

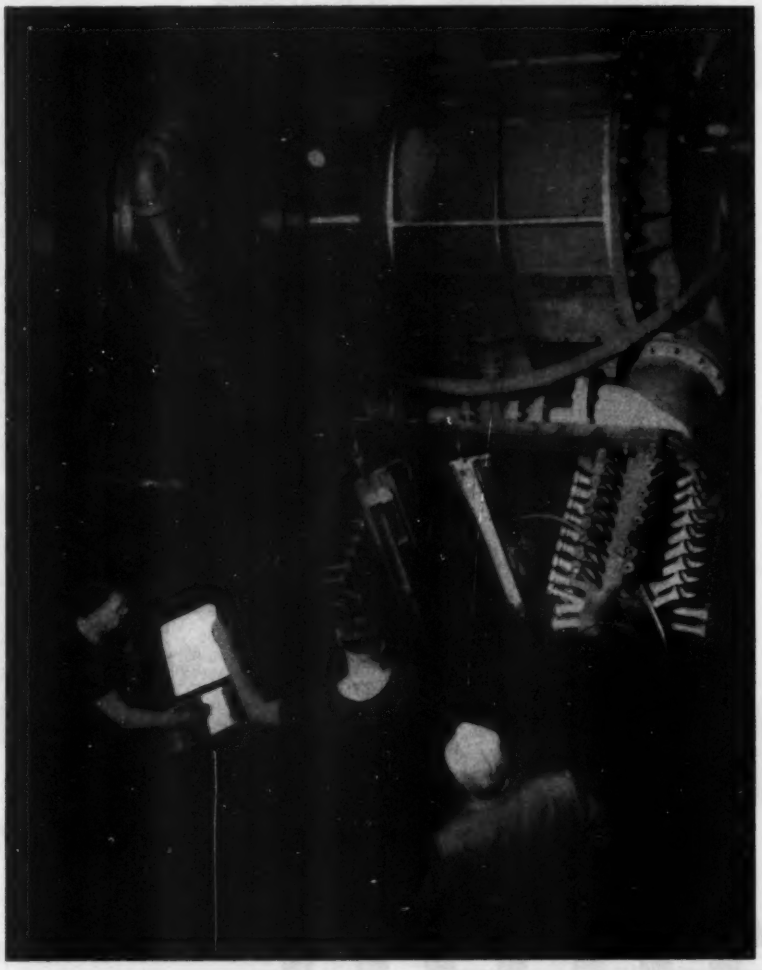
Smith McLandress, formerly eastern sales representative, has been named sales director for Appleton Wire Works. He is succeeded in the East by **Robert W. Kranzusch.**

Paul Torre, veteran papermaker recently associated with Leland Chemical Co., has joined the Shartle Div. of Black-Clawson Co. as an eastern sales representative.

G. L. Stancliff Jr. has been appointed vice president and general manager of Askania Regulator Co.

(Turn to page 59)

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



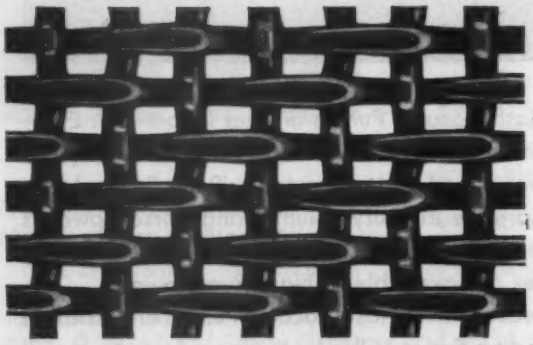
Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

440 WILSON ROAD, SO. NORWALK, CONN.

-it always means the best



Whatever the field or line of endeavor, specialization makes for superior results. Always, *since 1903*, Lindsay's entire attention and resources have been devoted to the weaving of Fourdrinier wire cloth for one purpose – *the manufacture of better paper and paper products.*

THE LINDSAY WIRE WEAVING COMPANY

CLEVELAND 10, OHIO

Lindsay **WIRES**

FOR PAPER MILLS

Names in the News . . .

George M. Darby has retired as director of the Westport, Conn. mill, D-O laboratories of Dorr-Oliver Inc. He has been with the firm in research 37 years.

Leonard J. Wood Jr., formerly supervisor of paper technical service, has been named paper development and mill service manager for National Starch Products Inc.

Wendell Grier, formerly with Bethlehem Steel Co., has been named eastern representative for the ACF lubricated plug valve department of W-K-M.

Paul W. Hatch, formerly with Dickie-Raymond Inc., has been named to the sales force of the organic chemicals division of Dewey & Almy Chemical Co.

Hubert Dobson, formerly with the Canning Machinery Div., has been made production manager for Hudson-Sharp Machine Co., a subsidiary of Food Machinery & Chemical Corp.

Charles F. Radley, one of the original directors of Oakite Products Inc., has retired as publicity director and board member. He continues as a consultant.

Robert D. Baer and **Russell A. Jenson** have been given assignments as field service engineers for F. C. Huyck & Sons of Rensselaer, N. Y. Baer, formerly with Griffith Rubber Mills, will serve the West Coast, while Jenson, just back from a tour of duty with the U. S. Army, will cover New York State and adjacent areas.

Bert S. Nelson, formerly with Foote Bros. Gear & Machine Corp., has been named director of engineering for the Products Div. of Hills-McCanna Co.

Hercules Powder Co. has reported two executive appointments. **Carl W. Eurenius,** assistant general manager of the Cellulose Products Dept., was made assistant general manager of the Paper Makers Chemical Dept.; and **Werner C. Brown,** director of sales for cellulose products, succeeds Eurenius.

Richard S. Buckley, director of sales since 1955, has been made vice

ANHEUSER-BUSCH, INC.

Sign of highest quality for the

PAPER INDUSTRY

GUMS
For tub sizing, coating and calendering.

STARCHES
Standard and special for beaters, tub sizing, coating and corrugating.

DEXTRINES
For coating, laminating and paper converting.

GELATINIZED STARCH
For beaters.

Corn Products Department
General Office
St. Louis, Missouri
721 Pestalozzi St.

Sales offices . . .

NEW ORLEANS, LA.
314 Girod Street

KALAMAZOO, MICHIGAN
1122 Royce Avenue

NEW YORK, NEW YORK
33rd St. and 12th Ave.

CHICAGO, ILLINOIS
750 So. Clinton

COLUMBUS, GA.
2319 Hamilton Rd.

SAN FRANCISCO, CALIF.
465 California

CAMBRIDGE, MASS.
111 Sixth Street

PHILADELPHIA, PA.
328 E. Chelten Ave.

president in charge of sales and technical service for Lockport Felt Co.

Necrology . . .

Wallace E. Parsons

Wallace E. Parsons, 68, president of Keyes Fibre Co. of Waterville, Maine, and of the Associated Industries of Maine, died March 6.

A native of North Anson, Maine, Parsons joined the Keyes staff in 1926 as assistant to the president. He was named to the top post in 1951.

Parsons was a director of the National Association of Manufacturers and past chairman of the NAM's committee on marketing and distribution. He also served as president of the University of Maine's Pulp & Paper Foundation.

William S. Lucey

William S. Lucey, retired executive vice president and director of Rayonier Inc., died recently in New York, N. Y., at the age of 72.

A graduate of the Massachusetts Institute of Technology, Lucey began his career with Eastman Kodak Co. In 1917 he joined the staff of Hammermill Paper Co., later becoming resident manager of Grays Harbor Pulp & Paper Co. in Hoquiam, Wash., now the Grays Harbor Div. of Rayonier. He retired in 1950.

Lancelot O. Rolleston, 57, a retired chemist and holder of many patents in the field of paper finishing, died recently at his Buffalo, N. Y. home. He was associated with International Paper Co. in New York State during the 1930's.

Oliver R. Foss, 70, retired general manager of American Felt Co. of Glenville, Conn., died recently in Cranford. He had been associated with American Felt about 40 years.

Walter Clayton White, former treasurer of Pequannock Valley Paper Co. in Butler, N. J., died recently at the age of 92. He was a direct descendant of the men who founded the firm in 1735. His son, Walter Clayton White Jr., is vice president of Pequannock Valley Paper.

Robert F. Gumbert, president of Plyfiber Container Corp. of Garwood, N. J., died recently after a brief illness. He was 46.

James Donald MacLaurin, president and owner of Tympan Paper Co. of East Orange, N. J., and a pioneer in the development of sealing tapes, died recently after a long illness. As a representative of a Scottish concern, he helped establish McLaurin-Jones Co. of Brookfield, Mass.

Roger Day Smith, retired chairman of the board and former president of S. D. Warren Co., died in December at his home in Dedham, Mass. He joined the firm as an office boy in 1890 and was president from 1925 to 1944. Among other achievements, Smith originated the concept of manufacturing a standard line of printing papers and selling it through established distributor channels on a national basis.

Henry W. Fieberts, 57, staff engineer for Downingtown (Pa.) Paper Co., died January 25. He was in charge of the firm's current expansion program.

George J. Lockbaum, 57, paper mill superintendent at the Mobile, Ala. plant of Scott Paper Co., died January 25 in Marinette, Wis. He had been in the Wisconsin city in an advisory capacity to Marinette Paper Co. Lockbaum had been formerly superintendent at the Fort Edward, N. Y. mill of Marinette Paper, a Scott subsidiary.

Edward C. Lake, 61, manager of converter sales for the film department of E. I. duPont de Nemours & Co. Inc., died recently in Wilmington, Del.

J. W. McLeod

James W. McLeod, manager of envelope specialty sales for National Starch Products Inc., died in New York, N. Y., while attending the annual Tappi convention. A native of Massachusetts, he had spent his entire business career in the adhesive industry. Widely known in the paper converting and packaging fields, he was a member of the Packaging Institute, Tappi and the Envelope Manufacturers Association and was at one time secretary of the Adhesive Manufacturers Association of America.

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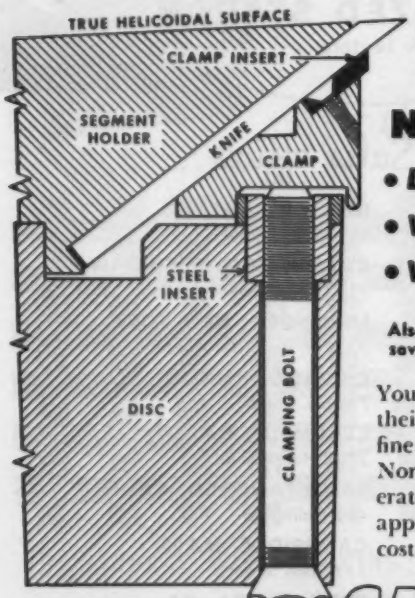

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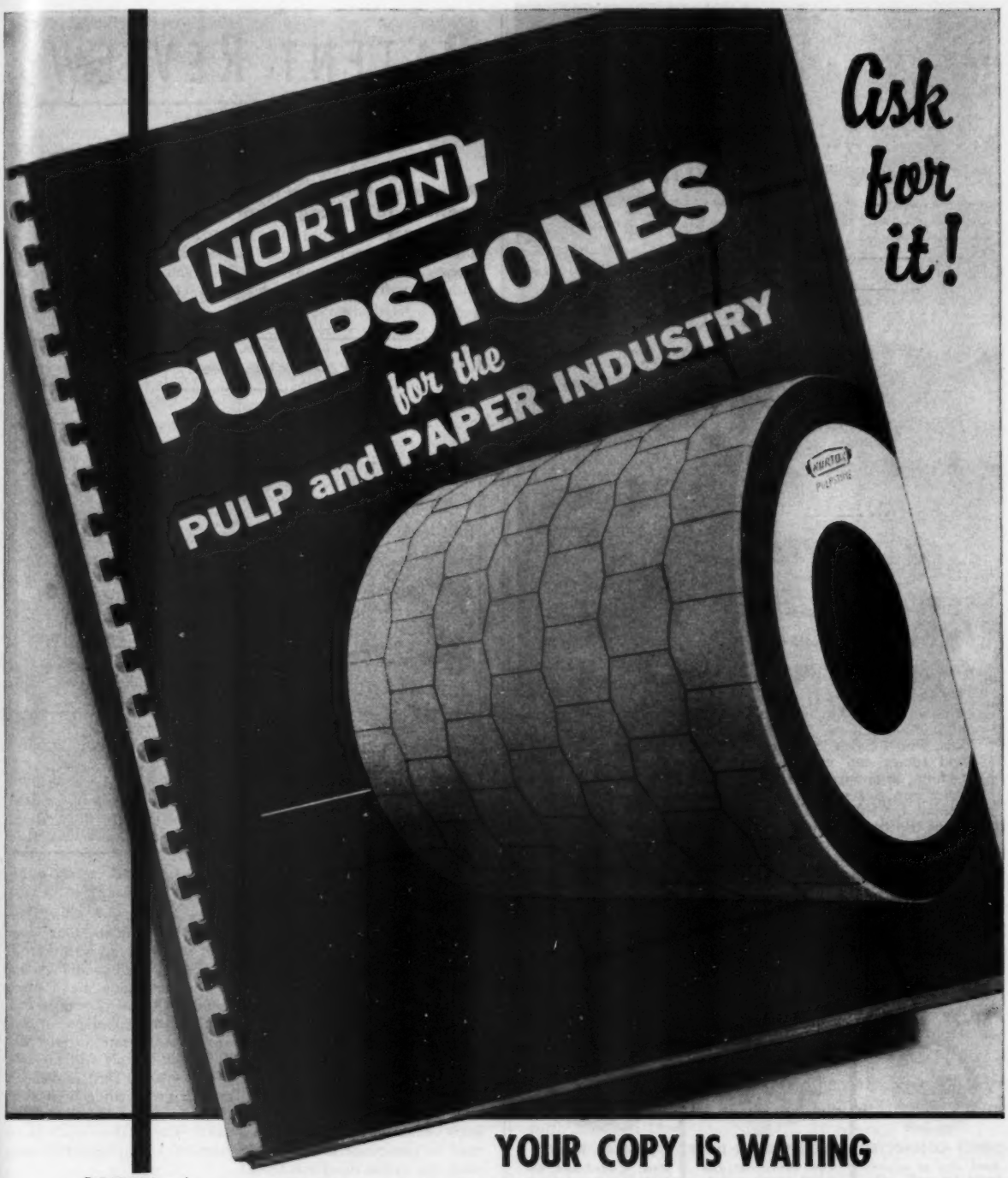

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PATENT REVIEWS

MELVIN NORD*

Recovery of cooking liquors from spent soda pulping liquors

U.S. 2,774,666, issued Dec. 18, 1956 to Daniel M. Barton and Eugene W. Schoeffel, assigned to Sterling Drug Inc., describes a process for pulping with caustic soda and regenerating the soda with practically no loss in washings and stack gases.

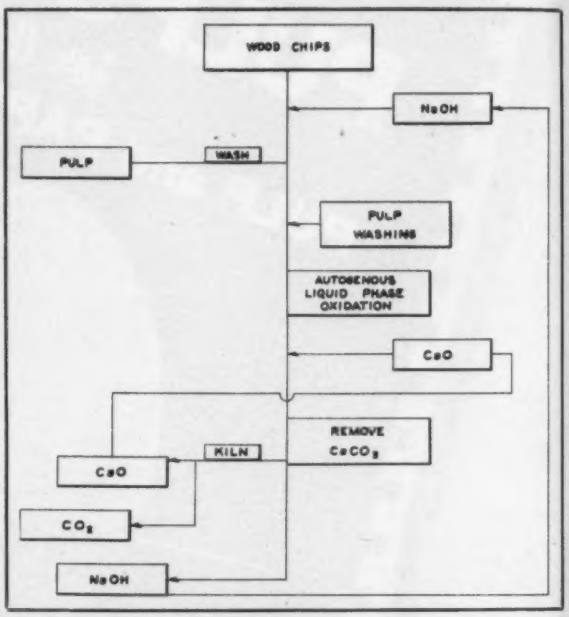


Fig. 1

As shown in Fig. 1, wood chips are treated with sodium hydroxide in a digester. The pulp is separated from the soda waste liquor, the pulp is washed with water, and the pulp washings are combined with the waste soda liquor. The pulp washings and waste soda liquor are then passed into an autogenous liquor-phase oxidation reactor, in which substantially all the carbon is converted to carbon dioxide and all of the hydrogen in the organic material is converted to steam. Since the soda waste material is a highly alkaline material, considerable carbon dioxide will dissolve, forming sodium carbonates and bi-carbonates. This mixture is then treated with calcium oxide, to cause precipitation of the calcium carbonate. This calcium carbonate is separated and kilned to form carbon dioxide and calcium oxide. The calcium oxide is reused to precipitate more effluent liquor from the oxidation step, while the carbon dioxide is vented.

The filtrate is sodium hydroxide, and is used for the digestion of more wood chips.

According to the inventor, make-up losses of sodium hydroxide are less than five per cent. Pulp and carbon dioxide are the only two materials which leave the process, there being no waste liquor effluent.

Recovery of chemicals in wood pulp preparation

U.S. 2,772,965, issued Dec. 4, 1956 to Kenneth R. Gray, Hartzell L. Crosby and John C. Steinberg, assigned to Rayonier Inc., relates to pulping operations for the digestion of wood chips with digestion liquor containing caustic soda and sodium sulfide, in which the resulting waste liquor is evaporated and burned to

*Patent attorney, 17600 Pinehurst, Detroit 21.

form a smelt from which to recover sodium-containing chemicals.

The invention provides improvements in the treatment of the waste liquor to lower the sulfur content prior to evaporation and burning and for the separation from the liquor of an alkali-type lignin.

The characteristic feature of the process is the subjection of the waste liquor to a pressure carbonation treatment, followed by stripping under vacuum to remove a substantial part of the sulfide sulfur as hydrogen sulfide, and simultaneously to separate from the liquor a lignin containing only a small amount of sodium and a small amount of organically combined sulfur.

Papermaking machine

U.S. 2,775,169, issued Dec. 25, 1956 to Ulf Gustav Soderlund and assigned to Aktiebolaget Karlstads Mekaniska Werkstad, describes a papermaking machine of the Fourdrinier type, in which there is no lower felt in the press unit — only an upper felt. In the suction press, the upper roll is the suction roll and the bottom roll is a plain roll. The suction roll engages the felt rather than the web.

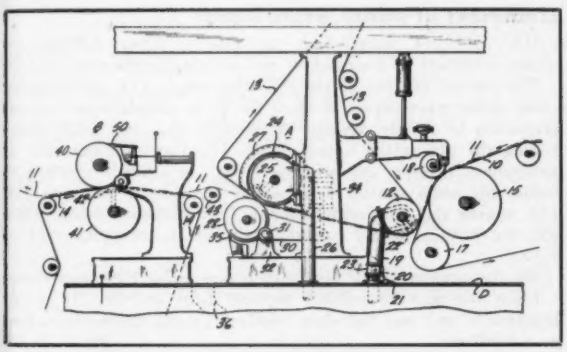


Fig. 2

As shown in Fig. 2, the pulp is applied evenly to the wire 10, forming a web 11 which is picked off the wire by a rotating transfer roll 12. The web 11, adhering to the lower surface of an endless moving felt 13, is carried through a press unit A. From the press unit, it is transferred to the top surface of another endless continuously moving felt 14 which carries the web through another press unit B. The web is then conveyed to the drying section of the machine.

The driven transfer roll 12 bears against the unsupported downwardly inclined stretch of the wire between the couch roll 15 and the wire drive roll 17, removing the web 11 from the wire 10 by suction.

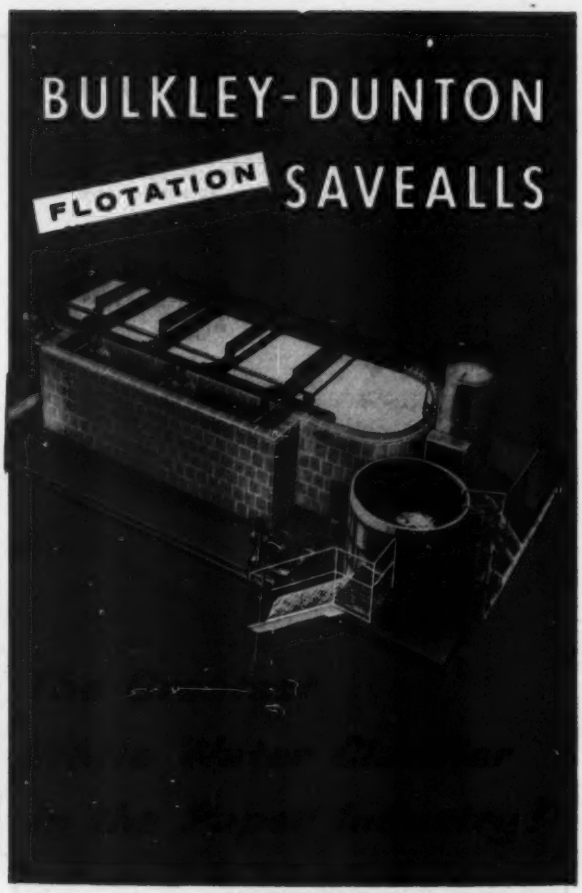
The upper roll 24 of the press unit A is a perforated suction roll having a suction zone 25. An upper hood 27 collects water thrown out from the roll. The bottom roll 28 of the press unit A is an idling stone roll. A doctor blade 35 bears against the periphery of roll 28, for scraping the web off roll 28 in the event of a break of the web between presses, as well as when initially drawing the web through the machine.

The press unit B is of a more conventional design, consisting of an upper roll 40 and a suction bottom roll 41.

Pulping wood chips with triethylene glycol

U.S. 2,772,968, issued Dec. 4, 1956 to Bror L. Grondal and Piotr Zenczak, assigned to Research Corp., provides a process for pulping wood chips at relatively low temperatures and at atmospheric pressure to produce a high quality paper pulp and a lignin complex having new and desirable properties.

As an example of the method of carrying out the process: Into an open top, steam-jacketed, reaction vessel equipped with a propeller agitator is placed 300 lbs. of triethylene glycol and 0.25 lbs. of anhydrous aluminum chloride catalyst. One hundred pounds of wood chips are added to the liquid. Steam is admitted to the heating jacket of the vessel and agitation is commenced. The temperature of the contents of the vessel is increased to 125° C. within half an hour, and is maintained for two hours, with con-



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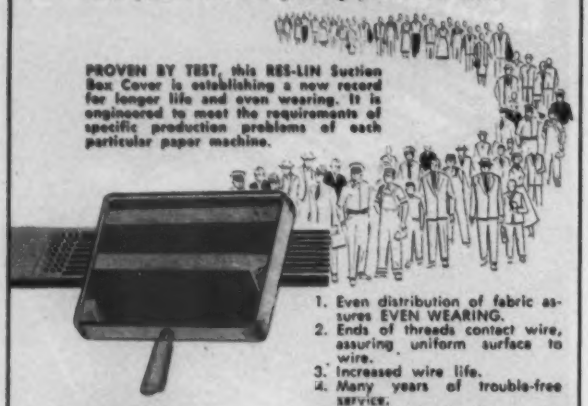

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tinuous gentle agitation. After substantially all the water has been driven out of the wood, the lignin complex dissolves very rapidly and defibration occurs in from one to two hours.

After completion of the cook, the digestion liquor is drained from the soft, disintegrated chips. The chips are pressed in a hydraulic press for further recovery of the digestion liquor. After pressing, the chips are washed with fresh triethylene glycol and then with warm water and finally dried in an oven at 60° C.

The dark brown digestion liquor thus recovered is diluted with 1.0 to 1.5 parts by volume of warm water, which causes most of the lignin complex to precipitate. The precipitate is recovered by filtration, washed with warm water and dried at 80° C., forming a finely divided light gray powder.

The dilute digestion liquor is evaporated to an anhydrous condition and is reused for digesting further quantities of wood chips.

The fibers produced by the digestion operation are very light in color and are made into kraft paper having high strength and light color.

The light-gray lignin complex powder is useful as an adhesive, a binder, surface coating material, and molding material.

Treatment of sulfite waste liquor

U.S. 2,774,754, issued Dec. 18, 1956 to Albert Schnell, describes a method of disposing of and utilizing sulfite waste liquor.

The process consists of the following steps: (1) concentrating crude sulfite waste liquor at about 60° C. in a multi-stage vacuum evaporator to a water content of about 30 per cent, while maintaining the pH of the liquor at 5-6; (2) further evaporation at atmospheric pressure and at about 80° C. in a film evaporator to reduce the water content to about 15 per cent at the same pH, (3) mixing this concentrated liquor in a planetary mixer while still hot with sufficient calcium hydroxide to bring the pH to 7.2-8.0.

No incrustation of the apparatus occurs under these conditions.

Upon cooling, the product becomes hard and dry. It is not hygroscopic and may therefore readily be stored for use as a fuel or a fertilizer.

Insulating board

U.S. 2,773,763, issued Dec. 11, 1956 to Wylmer L. Scott and assigned to Armstrong Cork Co., describes a method of producing a fire-resistant mineral fiber board having acoustical, sound, or heat-insulating properties.

The mineral fibers may be glass wool or mineral wool, thereby imparting fire-resistance. High strength is obtained by the use of a binder produced from kraft pulp. The kraft pulp is so prepared and treated that it has a low lignin content (a permanganate number below 16) and is hydrated to a substantial degree (below 10cc. Canadian freeness-3 gram). In this form, it is an excellent binder and also aids in the dispersion of the mineral fibers.

Bentonite is also added to the mix, imparting additional fire resistance. A glazed, rigid surface is imparted to the product when it is exposed to a flame.

U.S. 2,773,764, (same date and same assignee) deals further with the method of production of the board.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Non-returnable bottle carrier	Fort Orange Paper Co.	2,770,391	11/13/56
Combined dispensing carton and attached collapsible measuring cup	Dorothy L. Eckley	2,770,403	"
Shirt collar support	R. N. Williams Paper Co.	2,770,405	"
Carton construction	St. Regis Paper Co.	2,770,406	"
Ornamental container	Carl S. Dahm	2,770,407	"
Container-feeder for poultry	Minnesota Mining & Mfg. Co.	2,770,408	"
Hollow-walled boxes	Marshall I. Williamson	2,770,410	"
Disposable food server for drive-in restaurants	Kenneth H. Mac Kay	2,770,411	"
Tamper-proof envelope	Mark Ribacoff	2,770,412	"
Dispensing cartons with cutters	Sutherland Paper Co.	2,771,185-6	11/20/56

Cartons	Anthony A. Urbina	2,771,227	"
Stackable service tray	Kenneth M. Reed	2,771,232	"
Molded pulp carton	The Diamond Match Co.	2,771,233	"
Multi-sectional container	Pneumatic Scale Corp.	2,771,234	"
Reinforced bottle crate	Robert P. Stephenson	2,771,235	"
Carrying package	M. B. Claff & Sons Inc.	2,771,236	"
Shoe box with a tie ribbon	Stanley J. Philipson	2,771,237	"
Photographic print folder	Double Envelope Corp.	2,771,238	"
Web control mechanism for paper converting machine	United States Envelope Co.	2,771,252	"
Paper web with a simulated woven texture	Paterson Parchment Paper Co.	2,771,363	"
Pulp-wood bark-removing machine	Anthony Bradenthaler	2,771,922	11/27/56
Apparatus for bundling corrugated cardboard blanks	Ludwig Clemens	2,771,935	"
Folding display paperboard box	Irving Bekoff	2,771,986	"
Partitioned bottle carrier	Gardner Board & Carton Co.	2,772,020	"
Cartons	J. Lyons & Co. Ltd.	2,772,042	"
Fibre container with reclosure cover	American Can Co.	2,772,043	"
Handled carton	Inland Container Corp.	2,772,044	"
Continuous bleaching process	Hercules Powder Co.	2,772,138	"
Preparation of phenol derivatives from waste sulphite liquor	Ontario Research Foundation	2,772,139-40	"
Paper coating	Kimberly-Clark Co.	2,772,184	"
Coating paper with high solids content coating material	Combined Locks Paper Co.	2,772,604	12/4/56
Reduction of edge flashing on molded pulp articles	Keyes Box Co.	2,772,608	"
Box machine	Highland Box Co.	2,772,609	"
Method of making paperboard bottle carriers	Federal Paper Board Co. Inc.	2,772,610	"
Ice cream package	Marathon Corp.	2,722,827	"
Apparatus for evacuating pulp from high density storage towers	John P. Rich and Arthur L. Whiteside	2,722,864	"
Sized paper	American Cyanamide Co.	2,722,967 & 2,722,969	" "
Paper coating composition	National Starch Products Inc.	2,772,981	"
Treatment of Waste liquors	Stora Kopparbergs Bergslags Aktiebolag	2,773,026	"
Cradle-type carton for dolls	Federal Carton Corp.	2,773,327	12/11/56
Suction box having a roller face	Ernest A. R. Mathias	2,773,433	"
Continuous apparatus for making bags	Continental Can Co. Inc.	2,773,435	"
Display carton	Waldorf Paper Products Co.	2,773,589	"
Bottle carrier	Federal Paper Board Co. Inc.	2,773,625	"
Containers	Elmer Haslett	2,773,633	"
Paperboard carton pouring spout construction	Dairy Containers Inc.	2,773,634	"
Carton-type bags	Bemis Bro. Bag Co.	2,773,636	"
Bacon tray	Waldorf Paper Products Co.	2,773,637	"
Return mail folders	Henry R. Krohn	2,773,638	"
Machine for applying a sealing patch to the end of a tubular carton	Continental Paper Co.	2,774,204	12/18/56
Controlling the suction pressure on a transfer roll	Sulzer Freres	2,774,284	"
Box setting-up machines	M. B. Claff & Sons Inc.	2,744,285	"
Machine for folding box blanks	International Paper Box machine Co.	2,744,286	"
Suction stripping and stacking apparatus	International Paper Box Machine Co.	2,774,287	"
Wiping or doctoring device for removing excess coating from sheet material	E. B. Eddy Co.	2,774,329	"
Barking machine	Svenska Cellulose Aktiebolaget	2,744,397	"
Corrugated carton handle forming machine	Joseph E. McNamara	2,774,424	"
Means for longitudinally slitting webs of paper	Jagenberg-Werke Akt.-Ges.	2,774,425	"
Continuous rotary carton perforating machine	Keyes Fibre Co.	2,774,427	"
Support-protector for sealed-beam headlights	Keyes Fibre Co.	2,774,473	"
Staple sealed corrugated box	Fashion Frocks Inc.	2,774,529	"
Cell wall carton	The Bradley & Gilbert Co.	2,774,530	"
Coated paper products	Rohm & Haas Co.	2,774,602	"
Machine for screening and pulping of papermaking stock	The Black-Clawson Co.	2,775,168	12/25/56
Machine for bag making	Interstate Bag Co.	2,775,171	"
Paper roll handling attachment for industrial elevating tricks	Russell J. Carpenter	2,775,359	"
Pouring spout construction for paper containers	Mark Coralline	2,775,373	"
Handle attachment for paper cups	Continental Can Co. Inc.	2,775,382	"
Heavy duty fiber drum with a metal ply	Continental Can Co. Inc.	2,775,384	"
Drum with supported fiber bottom	Continental Can Co. Inc	2,775,385	"
Tapered top container depressor	James J. Cannon	2,775,386	"

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FOREIGN ABSTRACTS

Bleaching of rags

In seeking to obtain more effective bleaching of (white) cotton rags, the process variables of sodium hypochlorite, sodium chlorite, and hydrogen peroxide bleaches were studied.

When sodium hypochlorite was used, pulp brightness increased as the pH of the bath decreased from 13 to 7; the brightness decreased slightly as the pH dropped from 7 to 4, and then came up again, below pH 4. In bleaching operations carried out at pH 2, 4.5, and 4.6, there was a rapid increase in brightness during the first few minutes; subsequently the rate decreased.

By increasing the amount of hypochlorite, the pulp brightness increased to a maximum, which was then maintained with further increases in hypohlorite concentration. Brightness increased slightly by increasing the temperature of bleaching from 10 deg. to 30 deg. Using chlorite (activated either by hypochlorite or acid), the resulting pulp brightness did not exceed that reached by hypochlorite alone, within the same time period. Using a pulp consistency of about 3 per cent, hydrogen peroxide proved less effective than did hypochlorite, within the same time period.

However at 20 per cent consistency, rag pulps could be bleached to high brightness with hydrogen peroxide. An effective peroxide bleach was obtained by cooking at 20 per cent consistency with 1.0 - 1.5 volumes hydrogen peroxide, in the presence of sodium silicate and caustic soda for 2.5 hrs., at pressures up to 40 psi, followed by adequate washing. Without further bleaching, such stock reached a brightness of 86 per cent (or better). As compared with stock prepared by the usual caustic scour and hypochlorite bleach, peroxide treated pulp was brighter, but showed a somewhat higher fluidity, contained somewhat more ash and showed a 10 per cent decrease in breaking length and burst.

The peroxide process (outlined above) had been in operation for about two years (in 1955), and showed no harmful effects on overall pulp and paper properties.

F. J. T. Harris *British Paper and Board Makers Assoc., Proc. Tech Sect. 36,* 639 - 48; discussion 649 - 53 (1955); through *Chem. Abstracts 51,* 707 (1957).

Measurement of paper web moisture

In the authors opinion, existing moisture meters are not easily adaptable to running paper webs. The so-called "Moister", an indirect moisture meter developed in Japan, can be attached to the dry end of the paper machine to indicate and record instantaneously, the moisture content of the moving sheet.

It is based on the principle that the attenuation of the microwave energy propagated throughout the wave guide is proportional to the moisture content of the paper web moving through the slit of the wave guide.

Details are given on the construction of the "Moisture", its accuracy and moisture measurements on typical papers are discussed. Thirteen figures are included.

A. Nakanishi, T. Horii and H. Fujiwara. *Tech. Bull. Research Inst. Govt. Printing* Bur. (Tokyo) No. 1, 9-20 (1955) (*through Bull. Inst. Paper Chem.* 27, No. 1, 46 (1956) (original in English).

The Spanish Pulp and Paper Industry—that of S. France

The author wandering through southern France and Spain, gives a comprehensive description of the industrial developments in these regions. The article is well illustrated. Some emphasis is placed on the operations of SNIACE (*Sociedad National Industrias Aplicaciones Celulosa Española*) which manufactures eucalypts pulp, largely for the Spanish rayon and staple fiber industries. (cf Fig. 1 showing the pulp mill); on the functions of *La Papelero Española,* which supplies about 60 per cent of paper manufactured in Spain, and on the importance of esparto in papermaking.

Fig. 1

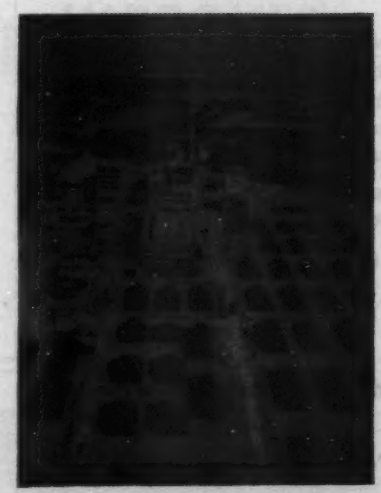

Fig. 2

The author also describes in some detail the operations of *Cellulose du Rhone* in Tarascon (S. France). A general view of the mill is shown in Fig. 2 (The roofed mounds are bales of esparto, which are carefully protected against fire).

In Gelinda (Spain), near Barcelona, is a branch of an ancient papermaking family Luis Guarro Casas which still turns out handmade paper for special purposes, using largely rag stock. They also use modern equipment in some of their other operations.

Eight illustrations are included. Hans Kotte, *Allgem. Papier-Rundschau 1956.* 1145-48; 1185-88; and 1233-39. (in German).

Wood as a chemical raw material

The enormous amount of waste from wood and from agricultural residues is reviewed, and the author then raises the question as to the most advantageous ways of utilizing these wastes.

Unless the fibers as such cannot be recovered, it is well not to resort to pyrolysis or complete hydrolysis, which at present are the only processes now in commercial use. Alkaline oxidation and hydrolysis under pressure followed by hydrogenation appears as a possibility in the preparation of petrochemicals like gasoline, kerosene, and especially gas oil (boiling at 260-375° C), lubricating oils and asphalt-like residues.

Special reference is made to the Heimemann process in this regard (cf *Petroleum Refiner* 33, 161 (1954). However, this method requires further study before it can enter commercial production.

Other possible means of utilizing the wastes are discussed, especailly with regard to products formed from wood sugars, and from lignin. No generalizations are made and none are possible, since raw materials, chemicals, potential sources of energy, and manpower vary over so wide a range. Notable difficulties in suitable utilization of these wastes are those involving their collection, preparation, transportation and storage, and these too are discussed.

Ten tables, a flow-chart (of the Heinemann process), four figures and 151 ref-

erences are included. Hermann F. J. Wenzl. *Holzforschung 10*, 129-143 (1956) (in German, brief English summary).

Alkaline degradation of wood

Following up their earlier studies, the authors have continued work on prehydrolysis and sulfate pulping of beechwood. In some instances the wood was refluxed six hours with 0.4 per cent hydrochloric acid. In all cases the alkali consumption during the various phases of the cook was studied with regard to pentosan and lignin removal.

Based on their data (given in 3 tables and a number of graphs), the authors developed a new alkaline 2-stage pulping process. The prehydrolyzed wood was heated with 2 per cent caustic soda at 160° (using a wood to liquor ratio of 1:5). The spent liquor was drained off, and the digestion was then completed with preheated 2.2 per cent caustic soda. The final black liquor, which still contained 1.2 to 1.6 per cent active alkali was fortified, thus bringing the alkali-content to 2 per cent. This liquor may then be used in the first stage of the subsequent cook.

The authors claim that this process saves 25-30 per cent alkali, and gives a pulp with improved properties. If the concentration of the liquor used in the second stage is increased sufficiently, the spent liquor may retain 2 per cent alkali, in which case it can be used directly in the earlier stage.

E. Correns and V. Jacopian. *Faserforsch. u Textiltech* 7, 387-92 (1956) (original in German); through. *Chem. Abstracts*, *51*, 706 (1957).

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Removal of resins from pulp

The author reviews the means of resin removal, which embody those extractives dissolved by methanol-benzene. The removal of finestuff from pulp during fiber fractionation serves to eliminate 70-80 per cent of the extraneous components, with a pulp loss of about 4-5 per cent. This loss includes besides the finestuff, small amounts of longer fibers.

In the bleaching operation, the first (chlorination) stage does not lower the resin content. Actually, this resin appears to increase because of chlorine absorption by the extractive. Furthermore, this modified resin is actually less soluble in the second (alkaline extraction) stage of the bleaching operation. On the other hand, treatment of the pulp with chlorine dioxide gives rise to compounds — the solubility of which is increased, so that these are more fully removed in the subsequent alkaline extraction. The effects of alkali are augmented by the addition of certain surface active agents, especially nonyl phenylpolyoxyethylene. When phosphates are also added, the solubility in alkali of the resinous materials is increased still further.

Surface active agents used in conjunction with alkaline extraction are useful in removing extraneous materials from hardwood sulfite pulps, which are notoriously difficult to remove by alkali alone. The extractives in the wood rays are almost impossible to remove either by the usual organic solvents or by aqueous alkali alone, but can be extracted by means of alkali containing nonyl phenylpolyoxyethylene. The author believes that the difficulty soluble resins may account for the varying behavior of different pulps during viscose manufacture.

W. H. Rapson (*Pulp & Paper Magazine Canada* 51, No. 10, 147-51 (1956) (through *Das Papier* 11,L 5 (Jan 1967) (Original article is in English and the abstract in German).

Behavior of pulp mixtures

The author gives a brief resume of the effects of kraft cooking on the degree of polymerization (D.P.) at various maximum temperatures (ranging from 140° to 170°C.).

In this series 6 tropical woods were digested under identical conditions. At the *lowest* maximum temperature, the resulting pulps showed marked differences in D.P., ranging from 1240 up to 1520, de-

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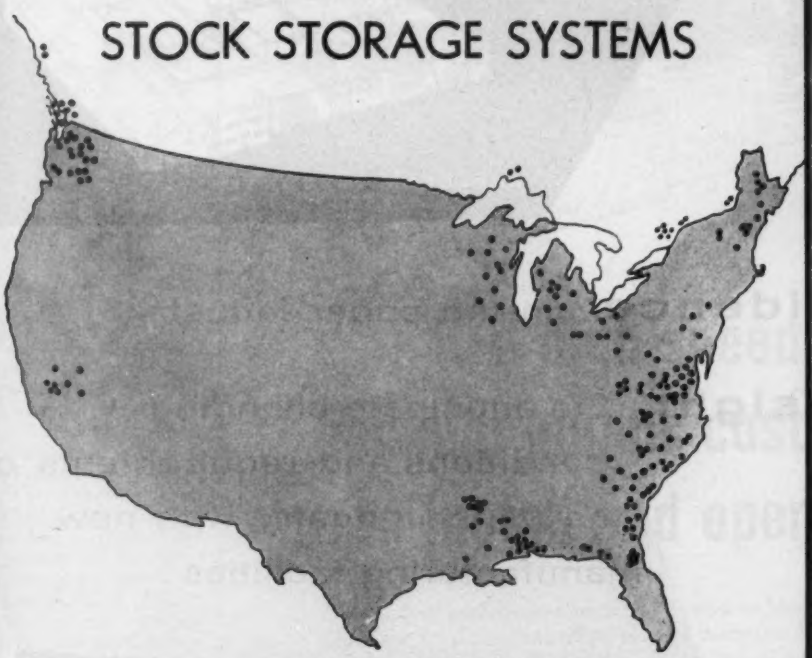

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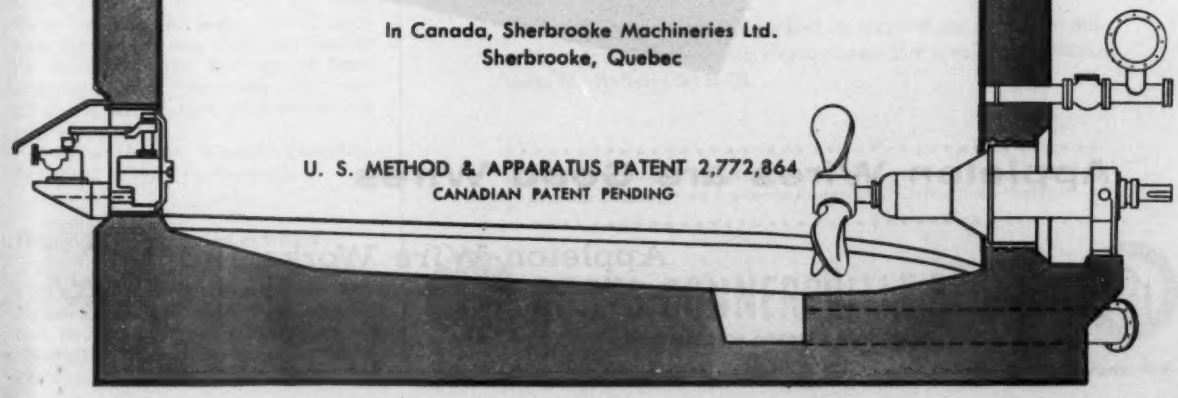

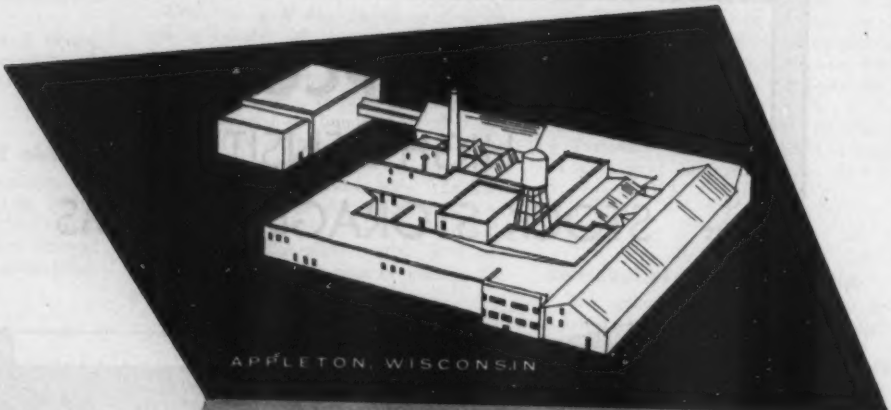

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pending on the species used. In each case the D.P. dropped as the maximum digestion temperature was raised, but the higher the initial D.P. (at 140°C.), the more rapidly did this decrease in chain length occur. For example *Sterculia* wood which when cooked at 140°C gave a pulp with D.P. 1520, at 170°C. gave a product with the D.P. 630.

The corresponding D.Ps of *Khaya ivorensis* kraft pulps were respectively 1240 and 720. Actually as the cooks became more drastic the final D.P.s of all pulps usually approached each other quite closely. When the springwood and summerwoods of spruce were separated from each other and cooked separately under identical conditions, the summerwood pulps showed a lower degree of pulping and a lower D.P. than did the springwood pulps. The overall yields and pulp differences were not very great.

When the pulps from woods containing characteristically different fiber properties were mixed in varying proportions, many of the strength properties could be calculated statistically from those of the individual components. This was true for breaking length, tear and absorptivity. On the other hand, the folding endurance of the pulp mixtures was markedly higher than that shown by the individual pulps alone, and the bursting strength also showed some improvement in the mixtures. One example is shown in Fig. 4, in which the pulp mixture is that of *Agathis* and *maple* (Ahorn). Here the *Falzzahl* (F) = number of folds, and *Berstflachen* (B) refers to burst.

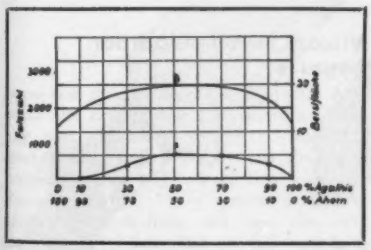


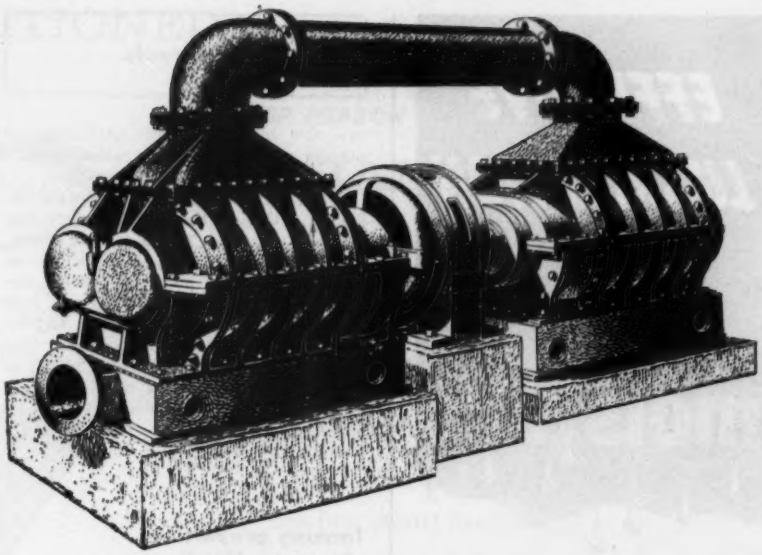
Fig. 4

The authors believe that when short fibered pulps are mixed with the long-fibered products, the former fill the interstices between the long fibers, and increase the internal surfaces. The type of hemicelluloses present presumably also contributes to the strength properties of the pulp mixtures.

Theodor Hopner. *Wochbl. Papierfabr.* 84,1020-22 (1956) (in German).

The pulp industry in Finland

The total production in 1956 showed a 50 per cent increase over that in 1950. Newer facilities in sulfite pulp manufacture, now partly in operation, include five "Wirbelschicht" pyrites burners, six evaporation plants for spent sulfite liquor, and



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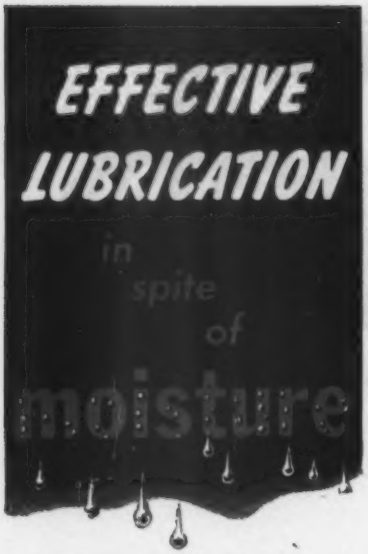

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Foreign Abstracts . . .

two new bleaching plants. A continuous pulping process for pulp manufacture is in full operation in the Joutseno mill.

The present annual outputs for the following mills are: Kemi Co., 110,000 tons of kraft pulp and 70,000 tons of sulfite; the Kaukopää Mills, approximately 300,000 tons of sulfate pulp and 200,000 tons of kraft liner board; the Joutseno Pulp Co., 80,000 tons of kraft pulp. In October 1956, the total pulp production in Finland reached a new record high of 92,000 tons of sulfite and 87,000 tons of sulfate pulp.

Jouko Koljonen. *Teknillisen Kemian Aikakauslehti* 1956, Dec. 31st. 663.5 (in Finnish with brief English summary).

Tanning properties of spent sulfite liquors

Sodium lignosulfonate was formed from crude magnesium ligno sulfonate, by precipitating the magnesium with sodium carbonate, centrifuging and neutralizing the decanted liquor, which was then spray-dried. The sodium salt formed in this way was mixed with an equal amount of resorcinol and 1/10 part concentrated hydrochloric acid and then refluxed 3 - 4 hrs. at various temperatures ranging from 100° - 140° C.

The resulting product was resinous and water soluble. Depending on the temperature used in the condensation, more or less resorcinol was bound to the lignosulfonute; *e.g.* 140°., 30 parts per hundred parts of the sodium lignosufonate. The tanning power of the products was evaluated by the fixation on hide powder (after 2 hours and after 24 hours), by the rate of penetration into gelatin gels, and also by actual tanning tests. The best product was that formed by carrying out the condensation at 130° C. The properties of the resulting leather are discussed. Evidently condensations carried out above 130° give materials that are too high in molecular weight to be useful. K. B. Mathur, S. K. Barat, and B. M. Das. *Bull. Central Leather Research Inst. Madras* 3, 23 - 34 (1956), through *Chem. Abstr, 51,* 748 (1957).

Small-dimensioned wood in pulp manufacture in Norway

The author, a director of the Union Co. in Skien, Norway, has calculated that small-dimensioned timber that should be taken out of the forest annually amounts to 800,000 cubic meters. Actually 500,000 cubic meters would be enough to satisfy the industrial demand provided the minimum (top) diameter is 4 cm.; this would include 350,000 cubic meters of spruce and 150,000 of pine.

In the post-war years to date, Norway has been unable to meet the demands of fibrous raw materials required by its pulp and paper industry by means of domestic sources. Considerable importation has resulted. Actually the proper utilization of small-dimensioned stock could, to a large degree, alleviate the situation. In this way, both forest owners and the industry would be benefited, and in the long run, there would be an improvement in the forest yield.

Even today some of this small timber is being used. However, transportation problems must be faced and solved. Furthermore, the barking and cleaning of these smaller timbers require equipment other than that used for ordinary pulpwood.

This problem was solved at Skien, where the author's company built a new debarking plant (Fig. 5) for small timbers. Using a continuous operation, the plant has an annual capacity of 90,000 cubic meters, and since the allied mill has started production of sulfite pulp by the so-called "pine-sulfite" process, spruce and pine may be used together; sorting of species is unnecessary and this reacts favorably on the problem of transport.

Jean Michelet, *Norsk Skogind. 10,* No. 12, 468-474 (1956) (in Norwegian, with English summary).

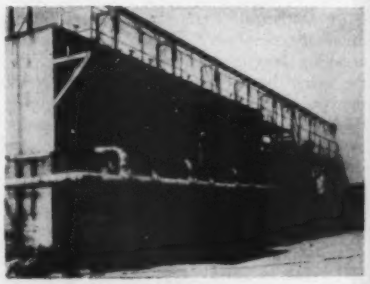

Fig. 5

Viscose rayon pulp from bagasse

A sample of Peruvian bagasse was separated by means of a wet process into three fractions:- 55.6 per cent fiber, 26.6 per cent pith and 17.8 per cent soluble matter, dust and losses. The fibrous portion contained more "pure" cellulose, much less ash, and less alkali-insoluble silicic acid than did the pith, and for this reason the experimental work was concentrated on the bagasse fibers.

Digestions for various time periods, at varying temperatures, were carried out with water, in a series of prehydrolyses. During this treatment only about one sixth of the alkali-resistant pentosans were removed, without seriously degrading the cellulose. A satisfactory operation consisted in prehydrolyzing 1½hrs. at a maximum temperature of 170° C, followed by a kraft cook for 3 hrs. with a maximum temperature of 160°C. using total (calculated) sodium content of 3 per cent. This gave a bright, easy-bleaching pulp, in yields of 38 per cent retaining only 0.4 per cent lignin. Bleaching with chlorine followed by alkaline extraction and hypochlorite, required 1.1 per cent chlorine based on the unbleached pulp; the yield was 98 per cent (based on the unbleached product), and the pulp brightness was

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over 93 per cent. The bleached pulp yield, (based on the original untreated bagasse) was 20.7 per cent. The pulp gave 3.66 per cent furfural and had a D.P. of 641. Its alpha — cellulose content varied with the method used, but the minimum was 91.95 per cent. When subjected to the xanthation process, this pulp gave clear solutions without fibrous residues, and is suggested as a satisfactory dissolving pulp.

Thirty-seven references, six tables, and five graphs are included. Georg Jayme and Karl-Heinz Rosenstock, *Das Papier* 11, 7-14 (1957) (in German).

Fig. 7

Paper mill on the Kaipolanniemi Peninsula

This mill, of the United Paper Mills Ltd., (Finland) manufactures 120,000 tons of newsprint annually which is used in 40 different countries. Prior to construction of the mill (which is now in operation), a road was built and a railway line was extended. Furthermore (as shown in Fig. 7), apartment houses were built for the personnel. Fig. 8, shows the paper machines (from the dry ends).

Fig. 8

A brief description of equipment is given. Five illustrations. Anon. *Finnish Paper and Timber.* 7, S07, 82-3 (1956) (in English).

Prevention of "blue stain" in pulpwoods

It was shown that sulfite spent liquors show resistance to the microörganism producing blue stain. Thus by steeping the wood for about one week in such liquors, they can be commercially protected against the stain.

K. Nishida, K. Kuroki, and N. Hashimura (Univ. Kyushu, Fukuoka). *J. Japan Forestry Soc.* (special issue) *Trans. of the 63rd Meeting 1954,* 369 - 71. [through *Chem: Abstr.* 50, 17433 (1956)].

Auxiliary chemical products used for improving printing papers

A Committee appointed for the processing of paper, with a view towards its improvement, made a number of commercial and semicommercial experiments in which they studied the effects of certain chemical products on the physical properties of the sheet.

The substances studied included starch, carboxymethylcellulose, paraffin, and certain cation-active artificial resins which showed an affinity for the pulp fiber. The experimental data were subjected to statistical evaluation, and a working hypothesis was established showing that starch and carboxymethylcellulose actually improve such sheet properties as breaking length, burst, tear, etc, and which are hydrophylic. Paraffin and waxes generally cause a weakening of the sheet, but they may show certain advantages when hydrophobic properties are desirable. The resins (like the formaldehyde resins) are intermediate in their action. The specificity in behavior of single products makes it advisable to use combinations in certain, special cases.

No general final conclusions were drawn from the experiments made to date, and further observations culled from commercial data are required. Four figures and 4 tables are given.

Hubert Wilfinger. *Das Papier* 11,1-6 (1957) (in German).

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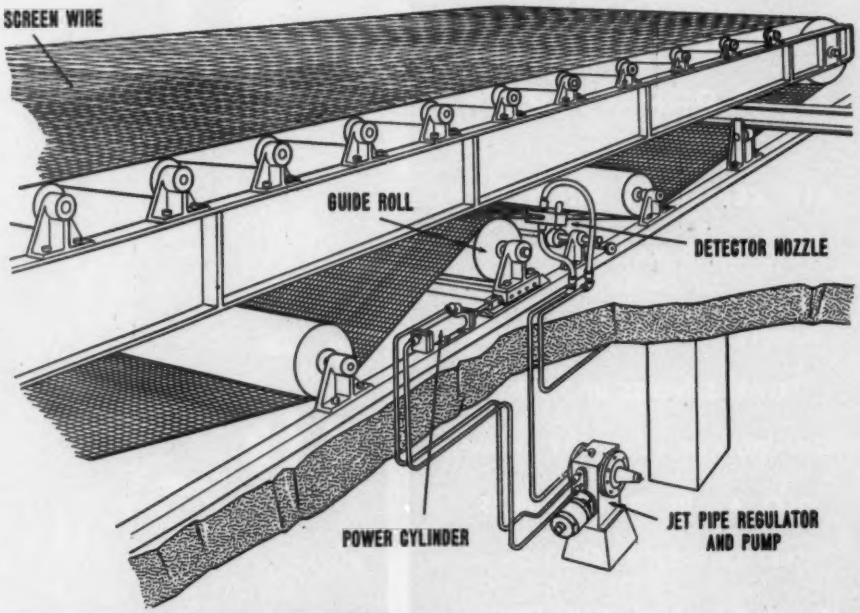

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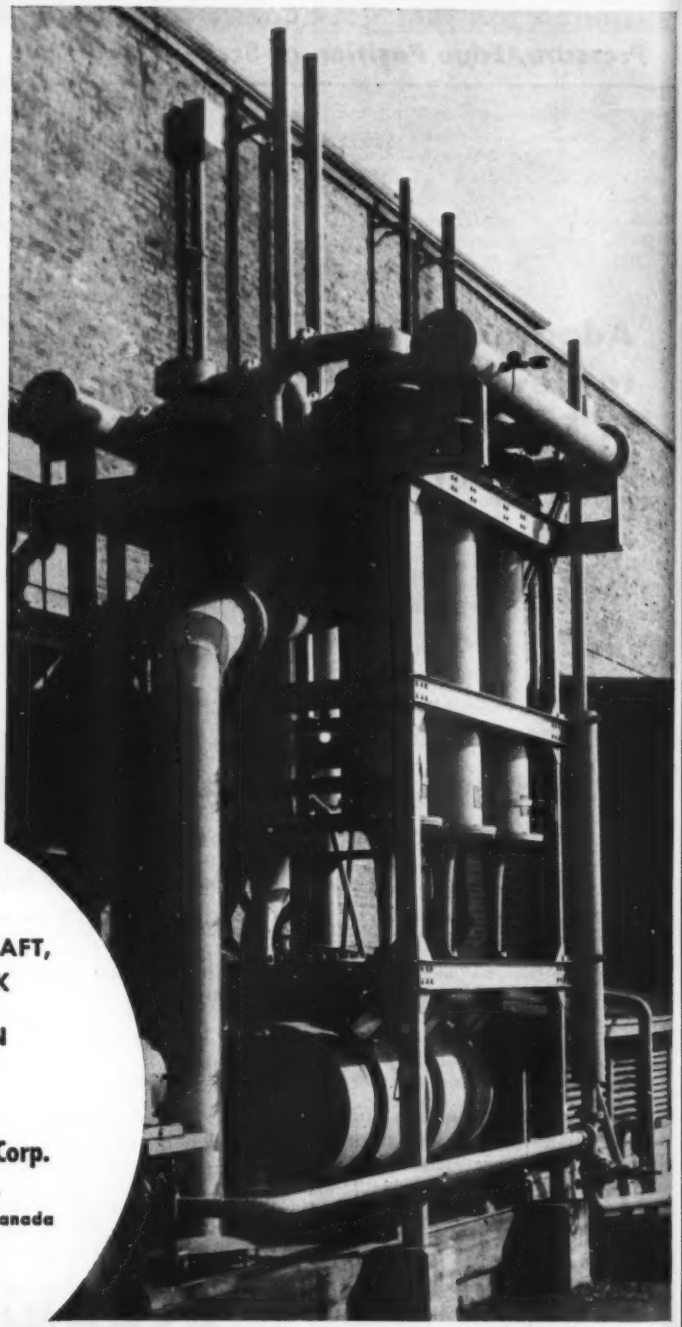

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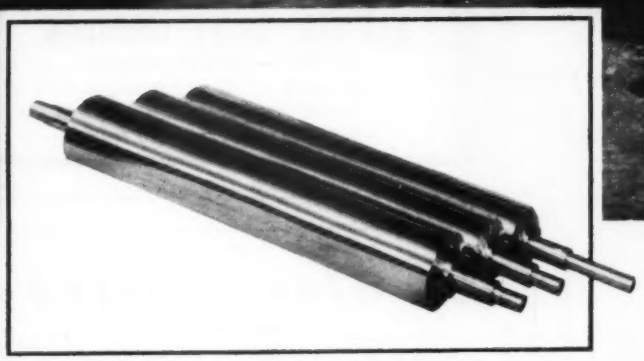

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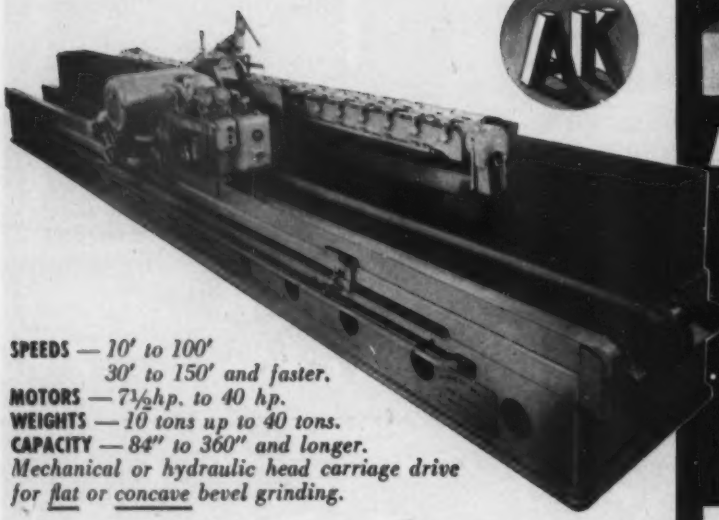

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These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Centrifugal pump for corrosive liquids

A pump has been designed to provide industry with better service in the low-range pumping of corrosive liquids.

These pumps cover a range from 1 to 80 gpm at heads up to 75 ft.

The company states that these pumps, known as "Flex-Seal" pumps, bring efficiency and dependability to an area previously limited to over-sized units cut down in range with attendant loss of efficiencies. *Bart Mfg. Co.*

Circle No. 13 on Readers' Service Card

Stainless pipe and fittings

A complete line of stainless pipe and pipe fittings which are designed especially for the pulp and paper industries is available with lengths up to 24 ft., sizes 5 in. to 24 in. OD.

The company states the line of pipe and fittings was designed to withstand corrosion and contamination conditions normally encountered in the mills.

A catalog giving complete description of fittings, sizes and tables is also available. *Swepco Tube Corp.*

Circle No. 14 on Readers' Service Card

Covering for conveyor belt splices

A self-vulcanizing rubber repair material can now be used to cover or protect conveyor belt splices.

This new material called Rema, provides a smooth belt surface, seals out moisture, reduces mildew, rot and deterioration—the great enemies of conveyor belts. Belt operation is also quieter when this material is used. *Flexible Steel Lacing Co.*

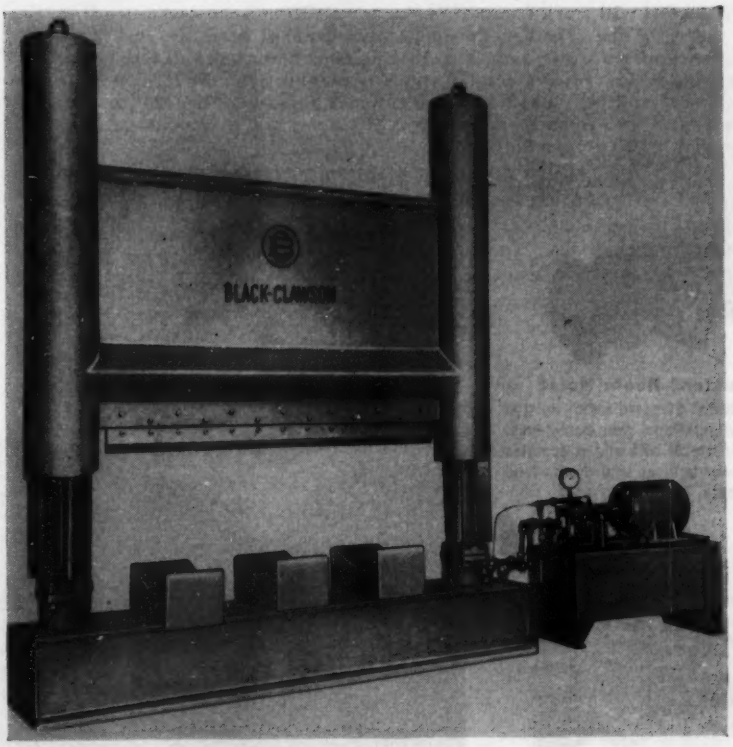
Circle No. 15 on Readers' Service Card

Motors

A complete line of totally-protected, vertical solid shaft P-base motors for all vertical pump installations have been announced.

The new motors, with normal thrust bearings in all sizes from 1 hp to 40 hp and high thrust in sizes from 1 hp to 15 hp, are available. They are all designed for indoor and outdoor installations and are corrosion-proof. *Reliance Electric & Engineering Co.*

Circle No. 16 on Readers' Service Card



Guillotine-type roll splitter

To solve the objectionable paper dust problem always present when "splitting" reject rolls with various kinds of saws, a new guillotine-type roll splitter has been developed.

The new machine is pictured above. Its powerful, hydraulically-operated steel knife will split a 60-in. diameter roll 72 in. long in a matter of seconds. There are no adjustments for rolls of various diameters. *Black-Clawson Co.*

Circle No. 12 on Readers' Service Card

Corrosion-resisting steels in tubing and pipe lengths

Two corrosion-resistant stainless steels are now available in tubing and pipe. Full-finished long lengths of 20 ft. 6 in. can be supplied. *Carpenter Steel Co.*

Circle No. 17 on Readers' Service Card

Flue gas monitoring system

This system employs accurate and reliable analysis of the O_2 content as a measure of excess air and can automatically adjust fuel-air ratio to maintain optimum combustion.

Some of the applications for which the system has been found effective is in fuel-air combustion equipment, including power plant boilers, process heaters, and SO_2 burners and steel open-hearths. *Leeds & Northrup Co.*

Circle No. 18 on Readers' Service Card

Slime Control

A new product has been developed for slime control. The manufacturer states that paper mills now using the product have found it to be a positive answer to the slime control problem.

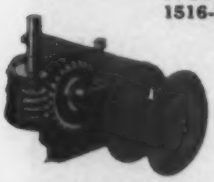
Known as M&T TBTO, this agent is also said to be safer in handling. Among

A CRANE COMBINATION for any PULP YARD PROBLEM!

WHAT is the crane combination you need? Northwest Cranes bring you every advantage for efficient handling in your pulp yard. There is a wide range of boom hoist equipment. Mast-type gantry with the sectional boom hoist rigging and pendent lines make possible ease of adjustment to boom length changes. You have a choice of two or three sheaves at the boom point. Adjustable jib, telescopic boom struts, removable counterweight—all can be had to meet your requirements. And, if you need long crawlers and wide treads, they're available.

Northwests will work from the car or travel from car to car, unloading as they go. The "Feather-Touch" Clutch Control gives the *feel of the load* without resorting to delicate mechanisms that often call for special knowledge for adjustment. If you are planning to modernize your pulp yard find out what Northwest Crawler equipment can do for you. Many well-known mills are using Northwests and a Northwest Man can give you complete details.

NORTHWEST ENGINEERING COMPANY
1516-2 Field Building, 135 South LaSalle St., Chicago 3, Ill.

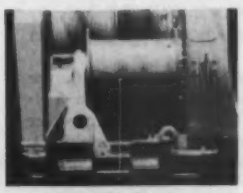


Standard Boom Hoist

The Northwest Standard Boom Hoist is a self-locking worm gear boom hoist running in an oil bath and it operates under power both up and down. It is safe, smooth, positive!

Independent High-Speed Boom Hoist

The Northwest Independent High-Speed Boom Hoist is independent of all other operations and permits booming with power controlled lowering without sacrificing either of the main drums. It is a rugged, heavy-duty unit capable of hour in and hour out operation. There is no finer, more reliable hoisting assembly.



Third Drum

The Northwest 3rd Drum operates independently of the main drums and is fitted with its own clutch and brake. It makes possible 3 load lines with a standard worm boom hoist; and 3 load lines with the independent high-speed boom hoist.

THE GREATEST COMBINATION OF PROVED ADVANTAGES EVER BUILT INTO A SHOVEL, CRANE, DRAGLINE OR PULLSHOVEL

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other features the agent is less toxic to humans; will not cause corrosion; is effective under all pH conditions; and lower in cost.

The company offers a data sheet which covers in technical detail, the method of application and other characteristics of the agent. *Metal & Thermit Corp.*

Circle No. 19 on Readers' Service Card

Plug-in static control unit

This new plug-in static control unit was designed to broaden the scope of statis switching to include protective functions such as undervoltage protection, undervoltage release, switch volts protection, overvoltage limit, fault indication and others. *General Electric Co.*

Circle No. 20 on Readers' Service Card

Magnetic device prevents scale and corrosion

"The Cepi Process" is an invention of a Belgian scientist which prevents scale and corrosion in piping and industrial equipment.

When using this process (or unit called Cepi fluid conditioner) the unit not only prevents formation of scale, but the treated water in contact with existing scale will cause many old deposits to disintegrate.

Special applications are available for scale conditioning of fluids in the papermaking industries. *Cepi-American Inc.*

Circle No. 21 on Readers' Service Card

Automatic filtration

A new line of combination units for the automatic filtration, regulation and lubrication of air supply to pneumatically-operated equipment.

Sizes which are currently available are ¼-in., ⅜-in. and ½-in. *Watts Regulator Co.*

Circle No. 22 on Readers' Service Card

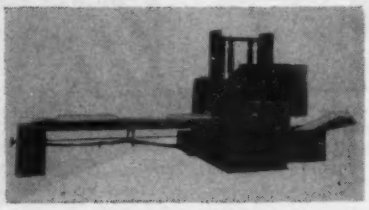
Outdoor fork truck

Designed for heavy duty in mud and over rough terrain, the Ranger-200 is now on the market. This outdoor lift truck has a capacity of 20,000 lbs.

The truck features a four-wheel drive, finger-tip direction controls, power-shift transmission and a torque converter with 3-to-1 multiplication coupled with a 143-hp GM diesel engine for maximum power under adverse conditions. A gasoline engine is optional.

The photo above shows the Ranger-200 in use. *Clark Equipment Co.*

Circle No. 23 on Readers' Service Card



Paper log cutter

This new machine is designed to take paper logs of toilet tissue, roll towels, folded towels and folded tissue from either winding or interfolding equipment and cut them to accurate lengths of from 4 in. to 12 in. in ½-in. increments. Log diameters of girths from 4 in. to 5 ½ in. can be handled.

The machine design also provides for running different diameter or length products at minimum change-over cost. Two lanes of product, cutting both simultaneously, are also handled by the machine. *Hudson Sharp Machine Co.*

Circle No. 24 on Readers' Service Card

Microscope

A new low-cost microscope has been developed and provides up to 3-in. working distance. It gives an erect, clear sharp image, correct as to right and left. The company offers a 10-day free trial basis. *Edmund Scientific Co.*

Circle No. 25 on Readers' Service Card

Polyvinyl chloride piping

A new line of PVC drainage fittings ranging in size from 1½ in. through 4 in. is made available. They match schedule 40 PVC pipe of corresponding dimensions and are available in the form of elbows, T's, Y's and other standard connections.

The company has reported that spent acids and other liquid wastes of industry

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Special features for better production...

New Cottrell five-color sheet-fed rotary letterpress for high speed production of fine quality boxboard printing. Photos courtesy of The Cottrell Company, Westerly, Rhode Island, a subsidiary of Harris-Seybold Company.

Cottrell rotary boxboard presses, built on the common impression principle, achieve remarkable color fidelity at speeds as high as 7000 sheets per hour. Available in 2, 3, 4, and 5-color models, they have many outstanding new features for better production.

The Cottrell spirally grooved plate cylinders in this high speed press were made from Acipco centrifugally spun steel tubes, "custom-made" for this application. Selected for strength combined with lightness, these tubes were furnished rough machined, 18⅛″ OD, 13″ ID, as cast, and 72¼″ long.

Because of the intricate, accurate finish machining which was required, these tubes were furnished in Type 1045 steel. The inherently better machinability of Acipco tubes, plus their "built-in" qualities of dynamic balance and dimensional stability, helped Cottrell produce this better press.

If your steel tube application is a special one, and requires a combination of special qualities and properties, your investigation of versatile Acipco steel tubes will be worthwhile. A call to your nearest Acipco distributor will bring full information.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls, as well as in hundreds of other industrial applications.

SIZE RANGE: Lengths up to 16′— longer lengths by welding tubes together. OD's from 2.25″ to 50″; wall thickness from .25″ to 4″.

ANALYSES: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steels; plain carbon grades and special non-standard analyses.

DISTRIBUTORS

Austin-Hastings Co., Inc.
226 Binney St.
Cambridge 42, Mass.

Peter A. Frasse and Co., Inc.
17 Grand St.
New York 13, N. Y.

Lyman Tube & Bearings, Ltd.
920 Ste. Sophie Lane
Montreal 3, Canada

Vinson Steel & Aluminum Co.
4606 Singleton Blvd.
Dallas 7, Texas

J. M. Tull Metal & Supply Co.
285 Marietta St., N.W.
Atlanta, Ga.

C. A. Roberts Company
2401 Twenty-fifth Avenue
Franklin Park, Ill.

Strong, Carlisle & Hammond Co.
1392 W. Third St.
Cleveland 13, Ohio

Ducommun Metals & Supply Co.
4890 So. Alameda St.
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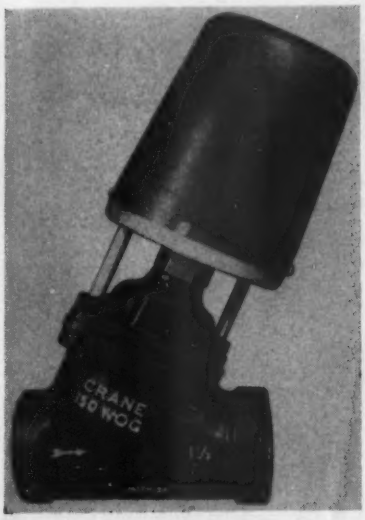
AMERICAN CAST IRON PIPE CO.
ACIPCO
Special Products Division
BIRMINGHAM 2, ALABAMA

New Products . . .

are being drawn off more economically in polyvinyl chloride piping. *Tube Turns Plastics Inc.*
Circle No. 26 on Readers' Service Card



All-electric valve operator

Valvetrol is the name given to a new all-electric rotary valve controller designed for mounting on the valve stem. It provides remote or automatic valve operation with proportional or on-off control.

The Valvetrol can be furnished mounted on the valve (as pictured above) or furnished separately for mounting on valves in the field. *Jordan Co.*
Circle No. 27 on Readers' Service Card

Pressure transmitter

A new inexpensive indicating-pressure transmitter for pneumatic transmission of process pressure measurements has been developed to give accurate scale range of ±½ per cent.

The unit measures pressures of 0-30 in. of water to 0-6000 psi, transmitting a 3-15-psi air signal to indicating, recording or controlling instruments. *Foxboro Co.*
Circle No. 28 on Readers' Service Card

Corrosion-resistant wire cloth

A corrosion-resistant titanium wire cloth has been developed. First used by a chemical processing industry, the wire cloth was found to be very successful and is now manufactured on a production basis.

In the pulp and paper industry, the cloth is showing excellent resistance to hypochlorite and chlorine dioxide bleaches.

Production orders are now being made for 30 x 30 mesh, made of .016-in. wire and 10 x 10 mesh with wire .035 in. in diameter. Other sizes are available.

The wire can be used in applications for screening operations, filtering assemblies, etc. *Cambridge Wire Cloth Co.*
Circle No. 29 on Readers' Service Card

Fig. 1

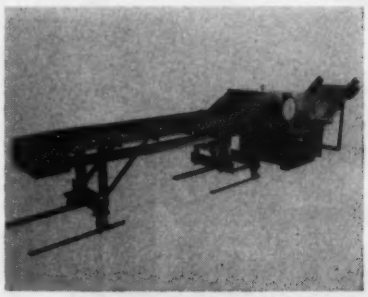


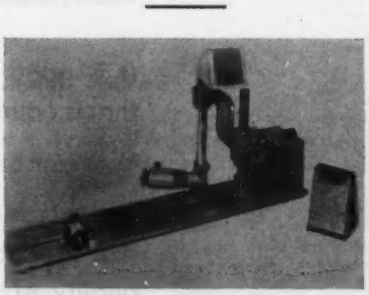
Fig. 2

Automatic feeding machine for rag cutters

With this machine, automatic continuous feeding of rags to a rag cutter at the rate of 15000 to 25000 lbs. an hour is now possible.

The feeding machine takes whole bales of rags, opens them and feeds them automatically to the feed apron of a cutter or to a sorting apron.

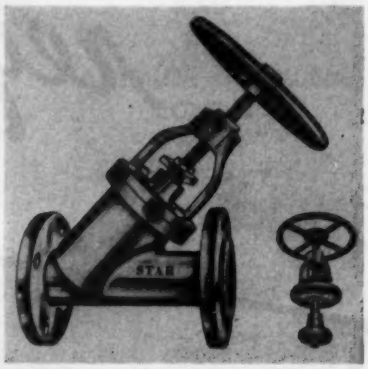
Fig. 1 shows the company's rag bale opener feeder, and Fig. 2 shows the pivoted arm feed rag cutter. *Taylor, Stiles & Co.*
Circle No. 30 on Readers' Service Card



Paper measuring projector

This device, pictured above, will quickly and accurately measure sheet paper or other similar materials. It is a special purpose measuring projector useful for determining odd sizes and for production checking.

The material to be measured is placed on the base and positioned against the stop and then moved toward the focal point beneath the lens tube. By observing the enlarged image of the paper edge and rule on the 3-in. by 3-in. crossline screen, exact size is determined. Cutting machines can then be set accordingly. *Stocker & Yale.*
Circle No. 31 on Readers' Service Card



"Y" valve

A new type all-fabricated, stainless steel "Y" valve with renewable-teflon disc is now in production.

It is completely fabricated, having smooth exterior and interior surfaces.

PAPER CONDITIONING

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BUILT TO OPERATE AT ANY MACHINE SPEED

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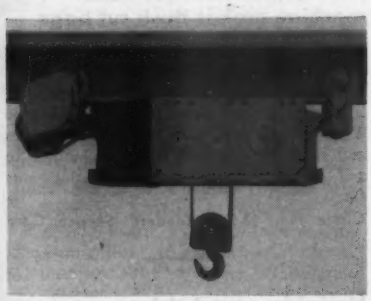
For further information, circle No. 11 on Readers' Service Card.

New Products . . .

It is being manufactured in pipe sizes—schedule 40 valves for schedule 40 pipe, schedule 10 valves for schedule 10 pipe, etc. *Star Tank & Filter Corp.*
Circle No. 32 on Readers' Service Card



Heavy-duty hoists

A new line of heavy-duty hoists has been designed for more compact and lightweight units. They are built for all-weather operation and are being made available with plain trolley, hand-geared trolley, motor trolley, deck, lug and hook mountings.

Pictured above is a 6-ton unit. This unit shows one of the new features in the new line—less headroom. The photo shows the load block extended, although in operation it can retract into a U-shaped area between motor, gear box and drum for maximum height lifts. *R. G. LeTourneau Inc.*
Circle No. 33 on Readers' Service Card

Variable speed pulleys

Variable speed pulleys with a speed ratio of 2½-to-1 have been developed. These new units are easily installed on old or new equipment.

Further information on sizes offered etc. is available. *Lovejoy Flexible Coupling Co.*
Circle No. 34 on Readers' Service Card

Amide softener

Designated as softener 64, this white, waxy solid, of low surface tension, disperses in hot water.

It is unusually resistant to high processing temperatures and hot pressing and gives maximum whiteness on white surfaces. It does not affect the colors on dyed or printed goods. *Glyco Products Co. Inc.*
Circle No. 35 on Readers' Service Card

Wheels for material handling equipment

A new wheel called Disowheel has been made with a tire composed of Disogrin. A feature in these wheels is that stationary heavy loads for extended periods have not shown appreciable flats.

The company states that by using Disogrin, the wheel is rated two to three times the capacity of synthetic material. A catalog is available. *Greer Industries Inc.*
Circle No. 36 on Readers' Service Card

Below-floor hydraulic lift simplifies paper handling

As shown in the photo above, the hydraulic table is installed below floor level

New Products . . .

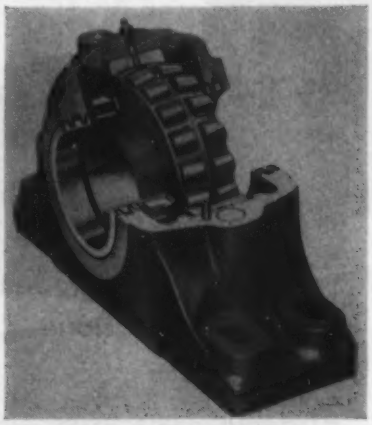
with top flush with floor. A skid-load of paper to be fed to the cutter is positioned over the table, and as operator feeds amounts of paper to the cutter he raises the load automatically with a foot pedal control, so the paper is always level with cutting machine.

The unit has a 3500-lb. capacity and a 40-in. lift. It stops at any fraction of an inch needed. *West Bend Equipment Corp.*
Circle No. 37 on Readers' Service Card

Two-shaft turret winder

Pictured above is the design of a new power-operated, two-shaft turret winder for use back of an extruder laminator.

The winder is an example of automation in the winding of poly-coated cellophanes, krafts, plain paper, etc. Rolls up to 1500 lbs. can be accommodated. *Hobbs Mfg. Co.*
Circle No. 38 on Readers' Service Card



Spherical roller bearing pillow blocks

Spher-Align is the trade name given to these new pillow blocks which incorporate a unique mounting feature.

The new mounting feature makes it possible to seat the Spher-Align bearings solidly on shafts quickly and easily.

Dimensions of these pillow blocks are standardized, making them interchangeable with all other similar units. These new bearings are offered in both expansion and non-expansion types and are stocked in sizes to fit shafts from 2 7/16 in. to 8 in. in diameter. *Dodge Mfg. Corp.*
Circle No. 39 on Readers' Service Card

Discharge hose

The construction of a discharge hose which is more than 250 ft. long has been announced.

The hose has an inside diameter of 4 in. and withstands pressures of 250 psi. It weighs more than 800 lb. and for ease of handling has built-in brass carrying rings. *H. K. Porter Co., Inc.*
Circle No. 40 on Readers' Service Card

New adhesive

Announcement has been made of a new adhesive which will bond Pliofilm, Saran and polystyrene to foil, as well as Pliofilm to Saran, and adhere Mylar to Pliofilm or Saran.

Clear amber in color, the adhesive is a synthetic rubber cement known as Resyn 76-3963. *National Adhesives.*
Circle No. 41 on Readers' Service Card

New attachment for cello machine makes flush cut bags

Potdevin Machine Co. has developed a new attachment for their cellophane bag machine.

With this new attachment, the machine is now capable of a wide variety of styles and sizes of bags with full lip, shallow lip and the new flush cut. *Potdevin Machine Co.*
Circle No. 42 on Readers' Service Card

Variable speed drive

Here is a variable speed drive capable of maintaining any speed within 1/4 of 1 per cent accuracy regardless of load fluctuations.

This packaged system consists of a Varidrive variable speed motor or Vari-drive Aero test stand and the new speed-sensitive Varitrol automatic control package. *U. S. Electrical Motors Inc.*
Circle No. 43 on Readers' Service Card

PAPER AND PAPERBOARD MAKING

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LESSONS IN PAPER MAKING

Pocket size, cloth bound text book of 372 pages covering all phases of stock preparation and sheet formation including the fundamental principles of making paper on the fourdrinier machine and paperboard on the multiple cylinder machine.

The author has fulfilled a life-long ambition to translate nearly fifty years of practical experience in a book that will be useful to the practical papermaker, technologist and executive.

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NEW LITERATURE

Books

CHEMICAL PROCESS ECONOMICS IN PRACTICE. Edited by J. James Hur. Published by Reinhold Publishing Corp. 430 Park Ave., New York 22, N.Y. 115 pages. $3.95.

This book comprises the seven papers presented at the Fourth Annual "Experience in Industry Symposium" sponsored by the Philadelphia-Wilmington Section of the American Institute of Chemical Engineers and the School of Chemical Engineering of the University of Pennsylvania.

Titles and authors of the chapters included in the book are: Why Accounting? by H. P. Kulp; Plant Investment by L. C. Knox; A. E. Lawrence discusses Cost of Services; Plant Operating Costs by H. R. Moody; the pricing of chemical products is told by F. Faxon Ogden; J. C. Martin defines Economic Analysis; and the last chapter by Will J. Price and Karl Finsterbusch gives the factors involved in Financing the Plant.

DIRECTORY OF RESEARCH IN THE GROWING AND HARVESTING OF PULPWOOD. Published by American Pulpwood Assoc., 220 E. 42nd St., New York 17, N.Y. $12.00.

This directory contains over 900 individual reports of research being carried on by all types of private and public agencies interested in forest resource management in the United States and its possessions.

Studies dealing with the subjects of genetics, direct seeding, artificial reforestation, the killing of undesirable trees and shrubs, chemical debarking, and the effect of intermediate cuttings on subsequent growth are all heavily represented.

The directory should prove to be of great interest to numerous foresters, whether they are research workers or woodland managers.

TABLES OF CHEMICAL KINETICS, HOMOGENEOUS REACTIONS. National Bureau of Standards Circular 510, Supplement 1, issued November 14, 1956, 472 pages, $3.25. Order from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.

This volume is the first supplement to Tables of Chemical Kinetics, Homogeneous Reactions, issued as NBS Circular 510 in 1951.

The circular contains a critically evaluated compilation of the available numerical data on rates and rate constants of homogeneous chemical reactions. The emphasis is placed on experimentally ascertained facts, and data depending on interpretations are not generally included.

METHOD FOR DETERMINING TENSILE PROPERTIES OF PAPER. Issued by the U. S. Forest Products Laboratory, Madison 5, Wis., and is available without charge.

This is a revised publication describing a method for determining the tensile properties of paper by using a suitable extensometer to measure specimen deformation. This method was found to be more satisfactory than measuring the specimen deformation by the crosshead movement of the testing machine.

Copies of this publication can be obtained by writing the director, U. S. Forest Products Laboratory, Madison 5, Wis. Ask for Report No. 2066.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Centrifuged Natural Hevea Latex. Stein, Hall & Co. Inc. A booklet announcing Unitex, a centrifuged natural hevea latex. The booklet contains a complete description of this product, from the planting of the rubber trees to delivery of the latex to consumers.
Circle No. 44 on Readers' Service Card

The Syphon Systems. Poirier Control Co. Technical information along with a blueprint drawing, this 4-page bulletin gives information on the company's Syphon system.
Circle No. 45 on Readers' Service Card

Materials to Increase the Value of Your Buildings. Stonhard Co. Inc. A six-page folder describing Concretite, a specially formulated liquid concentrate which, when added to water in the mix, gives extreme compressive strength to concrete or Portland cement mortar.
Circle No. 46 on Readers' Service Card

Truscale Remote Reading Gages. Jerguson Gage & Valve Co.. The company's new truscale remote reading gages are illustrated and described in a data unit. These gages are available with indicating scale inclined up for maximum visibility in applications where gages have to be mounted low on instrument panel, or inclined down for high installations.
Circle No. 47 on Readers' Service Card

Fire Protection Equipment List. Underwriters' Laboratories Inc. This list contains summaries of listing card reports on appliances and materials which have been examined primarily with reference to fire protective capabilities, and to such fire hazards and accident hazards as are involved in the groups in which they are listed. The list includes all listings up to January 1, 1957, and replaces all similar lists and supplements of earlier dates.
Circle No. 48 on Readers' Service Card

Steam Jet Heater Cuts Time and Eliminates Labor Cost in Cleaning Operation. Schutte and Koerting Co. Vol. 1 No. 6 Newsletter published by the company describes the Steam Jet Continuous Heater. Photos and cross-cut views are shown plus a stock size and price chart.
Circle No. 49 on Readers' Service Card

Synthetic Paraffin. Moore & Munger. A four-page brochure telling the story of Paraflint, the new synthetic paraffin imported from South Africa. This product is an exceptionally hard, high-melting point hydrocarbon wax.
Circle No. 50 on Readers' Service Card

Machine Knives. John W. Bolton & Sons Inc. The full line of machine knives manufactured by this company is covered in an 8-page bulletin. Besides describing the use applications in the pulp, paper and paper-board industries, the bulletin lists materials from which the knives are depending upon cutting requirements and conditions.
Circle No. 51 on Readers' Service Card

Close-cupled Industrial Pumps. Layne & Bowler Pump Co. Easy to use table for determining horsepower, capacity and head for vertical pumps are all contained in this 12-page bulletin. Sectional views, material specifications, schematic application drawings and photos of installations are also given.
Circle No. 52 on Readers' Service Card

Horizontal Pressure Filters. Cochrane Corp. This publication furnishes details on the company's horizontal pressure filters. It also describes operation, control, filter bed materials, design features, available accessories, etc. Drawings that illustrate various arrangements of two, three and four header units are also shown.
Circle No. 53 on Readers' Service Card

Vacuum Steel Tubing and Fittings. H-P Products Inc. A catalog giving the listings of all sizes of steel tubing and fittings for vacuum systems and conveying lines. The catalog gives complete listings along with diagramatical drawings and descriptions.
Circle No. 54 on Readers' Service Card

Methods of Applying Antifoam Agents. Hodag Chemical Corp. A four-page folder describing different methods of feeding antifoam agents to batch and continuous processes is available from the company.
Circle No. 55 on Readers' Service Card

1956 Yearbook of Forest Products Statistics. Food and Agriculture Organization of the United Nations. This is the tenth yearbook published which has been revised. It gives good, up-to-date statistics on forest products.
Circle No. 56 on Readers' Service Card

Marketing Information Available to Forest Owners. Forest Industries Council. This literature presents a summary of the findings of a survey of forest products marketing and price

POSTERS
— A POTENT SAFETY TOOL

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

425 N. Michigan Ave.
Chicago 11, Illinois

reporting services in the United States. The survey was made and this summary published by the Forest Industries Council, the policy-coordinating organization of the pulp and paper, pulpwood, and lumber industries.
Circle No. 57 on Readers' Service Card

Shredders, Grinders and Hashers. Jeffery Mfg. Co. This catalog, No. 907, illustrates and describes the company's ridgid hammer-type shredders, grinders, and hashers for reducing pulp laps, wood chunks etc. The 16 pages include photos, details of construction and operation and other general specifications.
Circle No. 58 on Readers' Service Card

Dock Ramps. Globe Hoist Co. A new line of Trans-O-Matic ramps offered by the company are described in a 6-page illustrated bulletin just published. These power-operated, automatic-leveling dock ramps are manufactured for either air-oil (air compressor) or electric operation.
Circle No. 59 on Readers' Service Card

Data on 17-4 PH Precipitation Harding Stainless Steel. Electric Steel Foundry Co. This is notebook No. 5, the first phase of the study directed toward establishing the mechanical properties after various heat treatments.
Circle No. 60 on Readers' Service Card

Special Steels for All Industry. Crucible Steel Co. of America. This is a 232-page product & warehouse catalog which is designed for purchasing agents. It describes over 700 products available from stock at the company's warehouses.
Circle No. 61 on Readers' Service Card

Maintenance Coatings. Skybryte Co. This catalog covers 12 products including No-Glare—the original factory window coating to reduce sun glare and heat. It also describes other alkali-resisting paints furnished by the company.
Circle No. 62 on Readers' Service Card

Protective Paint Coatings for Chemical Industries. Wilbur & Williams Co. A new folder giving descriptions of paint coatings offered by the company. These paints are for damp walls and ceilings in chemical plants.
Circle No. 63 on Readers' Service Card

Firebrick. J. H. France Refractories Co. Bulletin 551, issued by the company, describes their complete line of firebrick, high alumina and special Corindon brick. Technical data tables and other information on the brick are covered.
Circle No. 64 on Readers' Service Card

Rhoplex Acrylic Emulsions in Paper Coatings. Rohm & Haas Co. A 20-page booklet covering the results of the company's research on the characteristics of acrylic emulsions. The booklet is printed on paper made commercially with a combination of Rhoplex B-15 and alpha protein.
Circle No. 65 on Readers' Service Card

Non-shrink Mortar. Master Builders Co. How to get better results in 12 important construction operations by using non-shrink mortar, is discussed in a new bulletin just published by the company. Other benefits are shown in using non-shrink mortar.
Circle No. 66 on Readers' Service Card

Meters, Regulators and Valves. Rockwell Mfg. Co. A completely revised 28-page catolog covering the company's products. Photo-illustrated descriptions are also given in the catalog.
Circle No. 67 on Readers' Service Card

Thermal Insulations for Piping. Magnesia Insulation Manufacturers Assoc. Molded Masters of the Btu is the title of a color, sound slide-film just produced describing a family of four thermal insulations produced by the members for piping and equipment ranging from 200 ft. to 1900 ft. Supervised showings are offered to any groups interested in thermal insulation.
Circle No. 68 on Readers' Service Card

High-temperature Problems in Process Plants. Babcock & Wilcox Co. This is a paper on corrosion problems in the process industries. The report discusses the use of steel and its various alloys, and also the mechanical and physical reactions of the materials under various temperature and corrosive environments.
Circle No. 69 on Readers' Service Card

Worm Gear Speed Reducers. Cleveland Worm & Gear Co. A brochure describing the company's line of speed reducers. It also describes the company's catalog No. 400 which is also available.
Circle No. 70 on Readers' Service Card

Electric Radiant Heater. Edwin L. Wiegand Co. The new Chromalox U-RAD far-infrared electric radiant heater is described in a bulletin published by the company. This product has already been recognized in the paper industry.
Circle No. 71 on Readers' Service Card

Prestressed Concrete. The Preload Co. Inc. Bulletin T-15 describes prestressed concrete tanks for processing plants, pulp and paper mills, water storage and supply facilities and water treatment. The bulletin contains condensed data on the use of prestressed concrete for containment vessels, pressure vessels, silos and shell foundations.
Circle No. 72 on Readers' Service Card

How to Streamline Your Shipment Addressing for Speed and Economy. Weber Addressing Machine Co. Inc. A 16-page booklet that will be of particular interest to those concerned with addressing multiple shipments. It illustrates and

The Paper Industry

Professional and Business Services

Engineers
Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys
J. E. SIRRINE COMPANY
GREENVILLE
SOUTH CAROLINA

MILL COGS

We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "O" and instruction sheets free.

The N. P. BOWSHER Co., South Bend, Ind.

describes seven modern systems for fast, low-cost addressing of labels, tags and cartons.
Circle No. 73 on Readers' Service Card

Groundwood-type Pulp from Chips. Bauer Bros. Co. Eleven pages are devoted in describing the Bauerite process—a new method developed by the company for producing groundwood—type pulp from hardwood chips. The booklet is a reprint of an article, giving photos and diagrammatical drawings of the process.
Circle No. 74 on Readers' Service Card

Web Length and Winding HP Calculator. Black-Clawson Co. Inc. This calculator will enable you to determine in seconds the web length of any size roll. On the other side, you will find the hp needed to slit or rewind this roll. This is a helpful tool and can be sent to you free of charge.
Circle No. 75 on Readers' Service Card

CLASSIFIED ADVERTISING

TECHNICAL SERVICE REPRESENTATIVES

Our expanding Technical Sales Service Department requires additional technically-trained personnel. Experience in paper, corrugating or allied fields preferred. Requires handling problems relative to use of starch products in all industrial applications. Midwestern and Eastern locations. Excellent insurance and retirement programs.

Please send resume with details of education, experience and salary requirements to Director, Technical Sales Service, Clinton Corn Processing Company, Clinton, Iowa.

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

SUPERINTENDENTS & CHEMISTS

Do you use chemicals? If so, please let us hear from you as this may be your opportunity to go into business for yourself. Confidential. Write Box 644, The Paper Industry.

FOR SALE

1 Mitts & Merrill No. 15 CSE Hog, excellent condition, with several sets of high grade steel knives. Immediately available. Inspection invited upon due notice to purchasing agent. Best offer will be entertained. Address reply to Peter J. Schweitzer, Inc., Spotswood, New Jersey.

FOR SALE

1—4'x10' surface type F300 Tyler Ty Rock Screen, complete with 1—7½ HP motor with base, 1—7½ HP V-belt drive, and 1—set of drive and fly wheel guards.

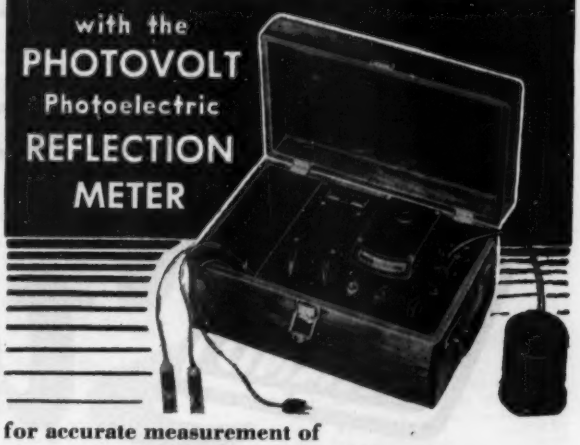
Practically new. In excellent condition. Can even be used as gravel sifter. Inspect at any time upon notice to Purchasing Agent. Best offer will be entertained. Address reply to: Peter J. Schweitzer, Inc., Spotswood, New Jersey.

INDUSTRIAL RELATIONS DIRECTOR

Having experience in industrial relations, actual negotiation of union contracts and all phases of personnel experience. $12,000 to $15,000 to start. Send resume to Cloud Employment Service, 907 National Building, Dallas, Texas.

You Can Be Sure!

with the PHOTOVOLT Photoelectric REFLECTION METER



for accurate measurement of *Brightness and Opacity* of pulp and paper in terms of TAPPI specifications.

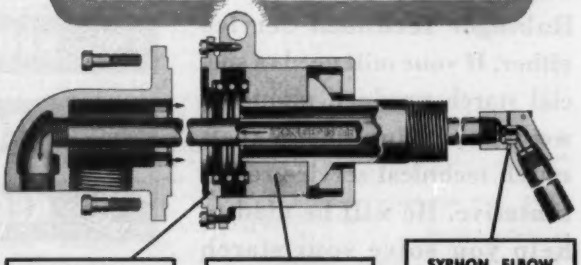
Also for *Gloss and Color* tests on paper, cardboard, and other paper products.

Portable, reliable, rugged, simple to operate

Also: Colorimeters, pH Meters

PHOTOVOLT CORP.
95 MADISON AVENUE NEW YORK 16, N. Y.

Johnson Joint
SELF-SUPPORTED TYPE with SYPHON ELBOW



ASSEMBLY PLATE — Holds internal parts in position when head is removed.

SELF-SUPPORTING — Needs no external supports of any kind.

SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

WRITE FOR INFORMATION

Bulletin S-2001 has all the facts on this joint-and-elbow combination that supports itself, has no packing, needs no lubrication, outmodes unwieldy syphon pipes. Johnson Joints are also available in pipe-supported and rod-supported types, to suit all operating needs.

The Johnson Corporation
845 Wood St., Three Rivers, Mich.

...for superior paper

Use OK BRAND Starches at no extra cost

the complete paper mill line

	Wet-End Additives	Press & Tub Sizes	Coating Adhesives	Calender Sizes
KEOJEL	●			
KEOZYME		●	●	●
KEOFILM				●
KEOCHLOR		●	●	●
KEOCOTE			●	
PEARL	●			
KEOGUM	●			

There's an OK Brand product especially formulated for every paper mill operation requiring starches and adhesives ...and there's no extra cost for these top-quality OK BRAND products.

There's no extra cost for Hubinger Technical Service either. If your mill needs a special starch product, phone or write for a Hubinger paper-starch technical service representative. He will be glad to help you solve your starch problems. You'll find him OK too.

The Hubinger Company

KEOKUK, IOWA

HUBINGER — QUALITY PRODUCTS from CORN — 76 YEARS

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	1.00—	1.05
No. 2 roofing (Chicago)	.60—	.65
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites, miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt. — Nominal

- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt. — Nominal

- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Bark cottons
- Old shopperies

ROPE and BAGGING

f.o.b. and ex dock New York City

Gunny No. 1, domestic	5.50—	6.00
Gunny No. 1, foreign	5.50—	6.00
No. 1 manila rope, domestic	—	
No. 1 manila rope, foreign	—	
New burlap cuts (soft)	6.00—	6.50
Sisal strings	—	
Mixed strings	—	

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—115.00
No. 1 hard white shavings	85.00— 90.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	55.00— 65.00
Fly leaf shavings No. 1	25.00— 30.00
Fly leaf, woody, No. 1	30.00— 35.00
Mixed colored shavings	18.00— 20.00
No. 1 books and magazines	17.00— 18.00
Ledger stock, white, No. 1 (carloads)	50.00— 55.00
Ledger stock, colored, No. 1 (Midwest ship)	35.00— 40.00
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	60.00— 70.00
Colored tab cards	45.00— 55.00
New all-kraft envelope cuttings	60.00— 70.00
Triple sorted kraft, 100%	35.00—
No. 1 old kraft	25.00—
White news cuts, No. 1	52.50— 57.50
No. 1 overissue news	16.00— 17.00
Folded news, special	14.00— 15.00
Folded news, ordinary	11.00— 12.00
Old corrugated boxes	14.00— 15.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	14.00— 15.00
Boxboard cuttings	6.00— 7.00
No. 1 mixed paper	5.00— 7.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt	5.05—
Powdered, drums, works, cwt	5.20—
1-Arginine, drums, kilo	74.80—
Blanc Fixe	
Direct process, bags, c.l., works, ton	110.00—
L. c. l., works, ton	120.00—
Bleaching Powder, drums, cwt	
Casein, domestic acid precipitated	
Standard, bags, 10,000-lb. lots or more, shipping point, lb	No Prices
Premium, bags, 10,000-lb. lots or more, shipping point, lb	No Prices
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh, bags, c. l., Georgia works, ton	10.00—
300-mesh, bags, c. l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt	3.15—
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29½—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled, lb.	.18 —
Rosin, gun, c. l., f.o.b. New York, cwt	
E	8.90—
F	8.90—
G	8.90—
WW	10.30—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	8.00—
N	8.10—
WG	8.60—
WW	8.90—
Saltcake, domestic, bulk Works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c. l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—
Solid, 76%, drums, c. l. works, cwt.	4.30—
Sodium Silicate	
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.47—
Pearl, 100-lb. bags, cwt.	7.32—
Powdered, 100-lb. paper bags, cwt.	7.44—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	26.50—
Talc	
Domestic, bags, c. l. works, ton	33.00— 39.50
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Dioxide	
Pigment, calcium-rutile base, regular, bags, c. l., lb.	.09¼—
High-tinting, drums, c. l., lb.	.09 —
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l., freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—
Bleached sulfite, Canadian	150.00—
Unbleached sulfite	130.00—
Unbleached sulfite, Canadian	130.00—
Bleached soda	145.00—
Bleached soda, Canadian	145.00—
Kraft, bleached hardwood	150.00—
Kraft, bleached	152.00—155.00
Kraft, bleached southern	155.00—
Kraft, bleached Canadian	155.00—
Kraft, unbleached southern	117.50—122.50
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	130.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	72.50—
Sulfate screenings	67.50—
Groundwood, dom.	82.50— 90.00

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	150.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	150.00—
Bleached sulfite, Finish, freight allowed	150.00—
Unbleached sulfite, Swedish, freight allowed	130.00—
Unbleached sulfite, Finnish, freight allowed	130.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	155.00—
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	19.80
No. 2 enamels	18.80
Machine-coated, 45- to 100-lb.	14.75— 18.40
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	16.55
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	15.65
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	63.20
75% "	48.45
50% "	36.95
25% "	31.00
Rag Content Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
100% rag	64.40
75% "	49.60
50% "	38.10
25% "	32.20
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	21.85
No. 2	21.15
No. 4	19.75
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.10
No. 2	22.35
No. 4	20.95
Newsprint (contract base price)	per ton
Rolls, standard	131.00—135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.25
Butchers, counter rolls	10.25
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

SAFETY NEWS

1956 NSC Pulp and Paper Contest Shows 6 Per Cent Rate Decrease

COMPETING MILLS in the 1956 National Safety Council contest for pulp and paper firms have reported an accident frequency rate 6 per cent below that of 1955. (Not included in this figure is the Pulpwood Logging Division, which showed a decrease of 35 per cent.)

Forty-eight contestants maintained perfect scores, as compared to 44 in 1955.

The year's frequency rate for all divisions (except pulpwood logging) was 7.18; for the pulp and paper division, 6.88 (down 7 per cent); for the paper converting division, 7.98 (down 4 per cent), and for the pulpwood logging division, 53.05 (down 35 per cent).

Contestants numbered 531, up from the 518 of 1955.

The total exposure reported was 570,568,000 man-hours, up 1 per cent from the previous year. A total of 4672 injuries was reported, down 13 per cent from 1955.

Mills in Group A of Division I (units averaging more than 170,001 man-hours monthly) recorded a 2 per cent decrease; those in Group B (85,001 to 170,000 man-hours), a 6 per cent decrease; those in Group C (42,501 to 85,000 man-hours), down 14 per cent; those in Group D (21,226 to 42,500 man-hours), down 3 per cent, and those in Group E (6000 to 21,225 man-hours), up 3 per cent.

In paper converting, the paper bag group showed an increase of 4 per cent; boxes and cartons, a decrease of 2 per cent; roofing paper, an increase of 2 per cent; insulation and building board, a decrease of 12 per cent, and pulp and paper specialties, a decrease of 7 per cent.

Division III (pulpwood logging) had a January-December frequency rate of 53.05, a 35 per cent decrease from the year before.

From the eligible mills in Division I the board of judges will choose the mill with the most outstanding record. This plant will be awarded the grand prize, the Edward Benton Fritz Memorial Trophy, presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY.

The National Safety Council has listed as follows the mills with the best records in each division — frequency rates in parentheses:

Division I—Pulp and Paper Mills

Group A

Minnesota & Ontario Paper Co., International Falls, Minn. (0.86); Flintkote Co., Pioneer Div., Los Angeles (1.09); Longview Fibre Co., Longview, Wash. (1.10).

Group B

Crown Zellerbach Corp., Port Townsend, Wash. (0.00); Munising Paper Co., Munising, Mich. (0.00); Georgia Kraft Co., Macon, Ga. (0.00).

Group C

Falls Paper & Power Co., Oconto Falls, Wis. (0.00); Fraser Companies Ltd., Newcastle, N. B. (0.00); West Virginia Pulp & Paper Co., Williamsburg, Pa. (0.91).

Group D

Owens-Illinois Glass Co., National Container Corp. Div., Big Island, Va. (0.00); Mead Corp., Wheelwright Div., North Leominster, Mass. (0.00); Container Corp. of America, Ogden Div., Chicago (0.00); Marathon Corp., Ashland, Wis. (0.00); Container Corp. of America, Chattanooga, Tenn. (0.00); Riegel Paper Corp., Hughesville, N. J. (0.00).

Group E

Celotex Corp., Cleveland (0.00); Kimberly-Clark Corp. of Canada Ltd., Kapuskasing, Ont. (0.00); Flintkote Co., Mt.

Georgia Kraft Wins Mead Trophy

Georgia Kraft Co. of Macon, Ga., has been awarded the George H. Mead Trophy for its safety record during 1956. This presentation is made annually to that mill in the Mead organization that has established the best record. (Georgia Kraft is owned jointly by Mead Corp. of Dayton, Ohio, and Inland Container Corp. of Indianapolis.)

The Georgia company reported no disabling injuries during 1956. As of January 16, the firm had operated more than 2,000,000 man-hours since the last lost-time accident. (According to the National Safety Council, this record represents the most consecutive man-hours worked by a mill of this type without a disabling injury.)

Among those present at the presentation were: Herbert A. Kidd, vice president and general manager of Georgia Kraft and a vice president of Mead; Francis H. Wagner, Mead safety director and former general chairman of the National Safety Council's Pulp & Paper Section; Dr. W. W. Baxley, company physician, and James A. May, resident manager for Georgia Kraft.

PRESENTATION OF the George H. Mead Trophy for safety achievement among Mead Corp. mills is made by Herbert A. Kidd (second from left), vice president of Mead and vice president and general manager of Georgia Kraft, to James A. May, resident manager for Georgia Kraft in Macon. At the left is W. M. Sloan Jr., safety supervisor for Georgia Kraft, while at the right is G. S. Gibson, industrial relations manager.

Carmel, Ill. (0.00); International Paper Co., Livermore Falls, Maine (0.00); United States Gypsum Co., Gypsum, Ohio (0.00); Johns-Manville Corp., Tilton, N. H. (0.00); National Vulcanized Fibre Co., Marshall Bros. Div., Yorklyn, Del. (0.00); Spaulding Fibre Co. Inc., North Rochester, N. H. (0.00); Banner Fibreboard Co., Wellsburg, W. Va. (0.00).

Division II—Paper Converting

Paper Bags

Thilmany Pulp & Paper Co., Kaukauna, Wis. (0.00); Pillsbury Mills Inc., Wellsburg, W. Va. (0.00); St. Regis Paper Co., Playa Ponce, Puerto Rico (0.00).

Boxes and Cartons

Group A

Container Corp. of America, Rock Island, Ill. (0.00); Mengel Co., Louisville, Ky. (0.00); Bartgis Bros. Co., Ilchester, Md. (1.29).

Group B

Container Corp. of America, Boyle Ave., Los Angeles (0.00); International Paper Co., Container Div., Kansas City, Kans. (0.00); Container Corp. of America, Carton Div., Chattanooga, Tenn. (0.00); Container Corp. of America, Santa Clara, Cal. (0.00); Container Corp. of America, Baltimore (0.00); Container Corp. of America, Carton Div., Cleveland (0.00); Mengel Co., Winston-Salem, N. C. (0.00); Fort Wayne Corrugated Paper Co., Rochester, N. Y. (0.00); Marathon Corp., Sunnyside, Wash. (0.00); Container Corp. of America, Carton Div., Seattle (0.00); Container Corp. of America, Container Div., Cleveland (0.00).

Roofing Paper

Ruberoid Co., Dallas, Texas (0.00); Bird & Son inc., Chicago (0.00); Ruberoid Co., Minneapolis (0.00); Johns-Manville Corp., Marrero, La. (0.00); Certain-Teed Products Corp., Dallas, Texas (0.00).

Insulation and Building Board

Minnesota & Ontario Paper Co., Insulite Div., International Falls, Minn. (0.66); Celotex Corp., Marrero, La. (1.36); Wood Conversion Co., Cloquet Minn. (1.60).

Specialties

Scott Paper Co., Fort Edward, N. Y. (0.00); Lily-Tulip Cup Corp., Augusta, Ga. (0.00); Marinette Paper Co., South Glens Falls, N. Y. (0.00); Container Corp. of America, Sefton Fibre Can Co. Div., Piqua, Ohio (0.00); Line Material Co., Texas Fibre Products Plant, Sherman, Texas (0.00); Container Corp. of America, Sefton Fibre Can Co. Div., New Orleans (0.00); Kimberly-Clark Corp. of Canada Ltd., Winnipeg, Man. (0.00).

Division III—Pulpwood Logging

Continental Can Co., Robert Gair Co. Inc. Div., Hodge, La. (14.73); St. Regis Paper Co., Bucksport, Maine (19.45); St. Anne Power Co., Beaupre, Que. (37.74).

The Executive Committee of the National Safety Council's Pulp & Paper Section will hold its annual meeting April 15-17 at the Royal York Hotel in Toronto.

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Some vital paper industry statistics

Total production of the U. S. paper industry in 1956 amounted to 31,500,000 tons, while wood pulp production totaled 22,200,000 tons. Wood pulp consumption in 1956 was 24,055,000 tons, and wastepaper consumption by the paper and board industry was estimated at 8,800,000 tons.

Average hourly earnings in the U. S. pulp, paper and board industry were $2.00 (as reported for April 1956), compared to those in the United Kingdom and France of 59.8c and 46.3c respectively.

According to American Forest Products Industries Inc., in January 1957 there was a total of 9594 tree farms in operation covering a total of 41,548,217 acres in 44 states.

Stream improvement through reaeration

A new approach to stream improvement is now under investigation by the Sulphite Pulp Manufacturers' Research League. The intention is to boost the dissolved oxygen content in river water by admitting air to the hydroelectric power plant turbines. Preliminary experiments have shown that increases in oxygen contents, as a result of such methods, amounted to less than 5 per cent.

A new mosquito repellent

An effective, long-lasting insect repellent, known as diethyl toluamide, has been developed by the U. S. Department of Agriculture in cooperation with the Army. In tests at the U. S. D. A. entomolgy laboratories at Orlando, Fla., where some 20,000 compounds have been screened in the search for an ideal repellent, diethyl toluamide has proved itself as the best repellent of mosquitoes, chiggers, flies and other biting insects.

The repelient is long-lasting and potent, has a pleasant lotion feel, can be applied to either skin or clothes and does not rub off easily. It is expected to be on the market this spring.

Spent sulfite liquor for coal mines

An experiment is underway to test the effectiveness of sulfite liquor as a road binder in coal mines, where rubber-tired shuttle cars are in use. It is estimated that there are more than 2500 miles of such roads in need of surface treatment to alleviate a serious dust hazard.

Emphasis on eucalyptus

A Brazilian mill now under construction by W. R. Grace & Co., originally designed for pulping bagasse, will be using eucalyptus for pulping material. It is believed in some quarters that this is indicative of a recent trend away from using bagasse as a source of an all-purpose pulp.

The eucalyptus trees brought in from Australia in the early part of the 20th century now are reported to number close to a billion in the state of Sao Paulo.

New developments in plastic piping

A fiber glass reinforced epoxy pipe is now on the market that can be used at temperatures above 220°F and at pressures of 1000 psi. The pipe is said to be tough and capable of withstanding the action of corrosive chemicals. It costs less than corrosion-resistant metal pipe of the same size and weighs only 1/5th as much.

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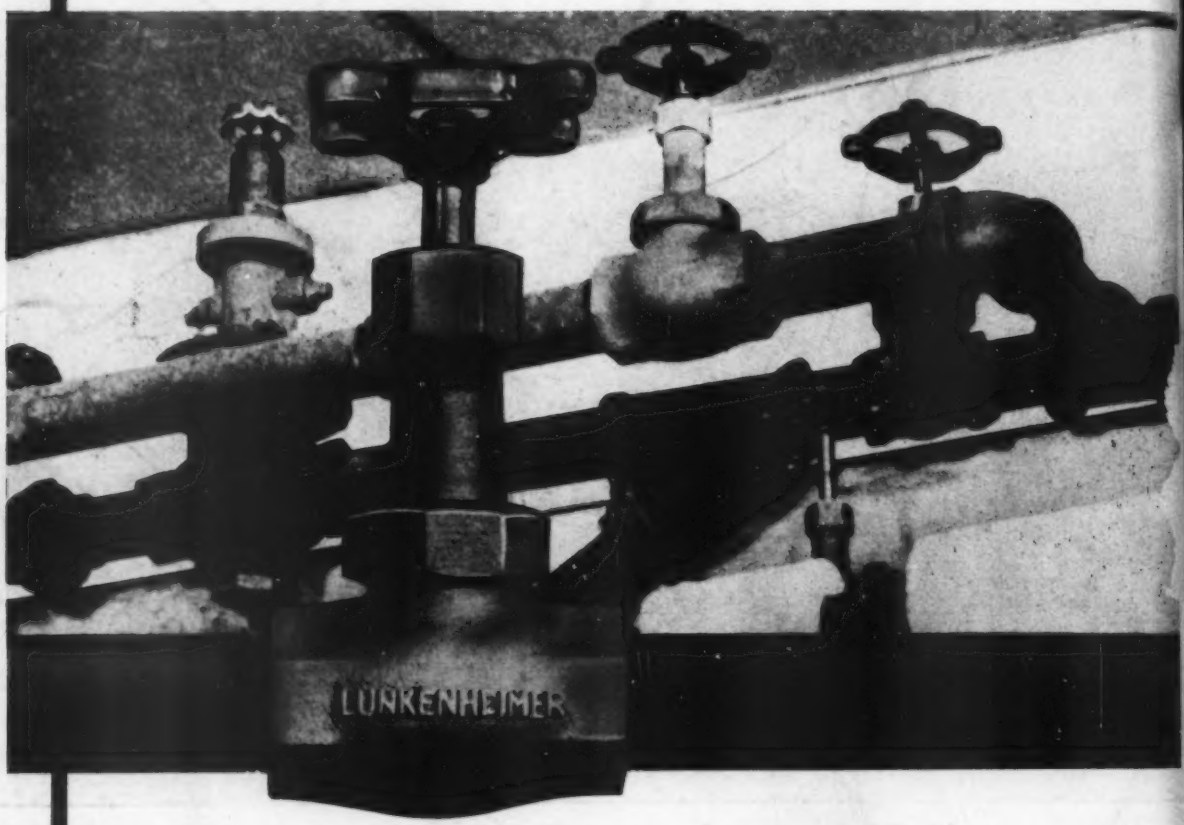

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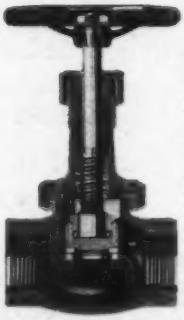

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